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The Energy Enslaver



By Mariner J. Kent

I'M not blowing hot air," said the inventor to Percy Randolph, "nor am I trying to interest you with a bit of blue sky. I have the greatest thing on topside of earth in the way of utilizing waste energy. No engine for any purpose has yet been constructed that does not waste power in performing the work that is put upon it. If the throttle valve of an engine could feel and respond to the strain like the feet of a wheelman, then it would be different.

"My new mechanical triumph is called 'The Energy Enslaver,' because it corrals and stores up the waste power of a motor so that it can be used to some purpose. The entire mechanism does not weigh more than a hundred pounds, and its cost is comparatively trifling. It has but three parts, and each one is small and compact; so small that they will not take up one-third of the space under the seat of a vehicle.

"This," continued the inventor, as he explained the working of the apparatus by means of a blue print, "is a compound air compressor; this is a seamless steel storage reservoir, and this the expanded air cylinder, fitted with a driving piston and rod. The air in the reservoir is stored at a maximum pressure of ten thousand pounds to the square inch. At the end of the piston rod and at the end of the compressor rod there is an L bearing that is attached to the driving rod or crank of the motor. When the air in the storage reservoir reaches the maximum pressure of ten thousand pounds a reducing valve that lowers the pressure to one hundred and fifty pounds to the square inch is automatically opened and the piston in the cylinder begins to move as in a steam engine. At the moment the reducing valve is opened another automatic device operates to unclutch the bearing of the compressor rod from the driving rod of the motor and to clutch the bearing of the piston rod to the driving rod of the motor in place of the bearing of the compressor rod." At this point the inventor became twisted and halted to recover himself.

"When," resumed the inventor, "the pressure in the storage reservoir is reduced to two thousand pounds to the square inch, or five hundred pounds less than is usually maintained for traction purposes, the automatic device reverses the action, and the clutch of the compressor is tightened and that of the piston loosened. In short, when the compressor is attached to the motor and is at work the piston is at rest, and when the piston is at work helping the motor with its load the compressor is at rest.

"In a word, the energy wasted by the motor is recovered and restored to the motor. The apparatus is under control of the driver through a foot lever that is independent of the automatic arrangement, and the air engine can be made to help the motor at any stage of the game. The amount of power required to run the compressor is so small," concluded the inventor, "that it is practically worked with the waste energy of a motor as, for instance, when the vehicle is at a standstill and the motor running, or where more power is being used than is necessary to propel the carriage, as, for example, in going down a hill."

Randolph was an up-to-date chap and was prevailed upon by the inventor to have an energy enslaver placed under the seat of his lightest automobile. Upon trial it worked so well that he was more than pleased with it.

Percy Randolph was an enthusiastic automobilist and every

afternoon he was out on the road. On one of his accustomed trips he had met a strikingly attractive girl driving unattended a stylish double pony phaeton. Thereafter he frequented the road on which he had met her and was rewarded by seeing her almost every day. But that was all. His cunningly contrived plans to scrape an acquaintance with the fair maiden of the phaeton were futile, and after



many days he had not succeeded in winning a smile of recognition from her, nor even a look that was sweeping enough to assure her exasperated and infatuated admirer that she had so much as bestowed a thought on him.

Elsie Millward had been aware of Randolph's admiration and his plainly shown desire to gain her acquaintance, and it awakened a proper feeling of resentment. Yet, being a charming girl, with a knowledge of it, she could not ignore the flattering side of this silent admiration of her, for although overbold, Randolph was a manly fellow and good-looking, and at thirty-one is at his best.

One day Randolph overtook the young lady that had so bewitched him and, with a boldness approaching rudeness, guided

the machine close beside her phaeton and ran along in that way for a considerable distance. Apparently, Miss Millward was unaware of his maneuver. As he was about to behave himself and move ahead and go his way, a little cyclone gathered under the seat of the automobile. The energy enslaver was leaking at some joint and the escaped compressed air expanding with mighty force tore off the thin bottom of the seat and lifted the cushion and Randolph clear from the automobile and tilted him into the phaeton beside Miss Millward. Randolph was equal to the emergency. "Pardon me," he said, "for my intrusion. Here is my card." Miss Millward, too astonished to speak, let him rattle on.

"If you will kindly overtake my auto," continued Randolph, "I shall be greatly indebted to you. When I left it I did not have time to shut off the power."

Miss Millward touched up her ponies and was soon beside the slow-moving automobile that, fortunately, had kept to the roadway. Randolph grasped the lever and stopped the vehicle, and Miss Millward reined up her team. Feeling that the situation demanded it, she ventured to remark that the motor must be a dangerous one.

"It was the energy enslaver that went off," replied Randolph, "and it is the greatest thing on earth. Although a little erratic at times it acted well this afternoon in the matter of our introduction."

Miss Millward did not drive away until after Randolph had succeeded in obtaining permission to call on her, and strange to relate, before many days Randolph's automobile had often two occupants, one of whom was "Elsie" and the other one was "Percy."

That the course of true love never runs smoothly is an adage as trite as it is true, and although Randolph had the energy enslaver repaired and the seat of his automobile sheathed with steel, the compressed air arrangement was too much for him.

It all occurred out on a country road, amid pastures green and in the shade of fruitful apple trees. One afternoon, as Elsie and Randolph were bowling along in the happiest of moods, there came a biff! zip! kerslam, and the two shot into the air. The reservoir of the energy enslaver had burst, and in the explosion that followed the steel sheathing under the cushion held firm, and consequently the entire seat was torn from the body of the vehicle, and unguided, the latter went its wondrous way. Elsie and Randolph alighted in a dwarfed and gnarled apple tree that by chance had

grown up by the roadside. And, as they had clung to each other as they soared skyward, they found themselves seated side by side on a stout bough, scant of breath, but unhurt saving a few scratches.

"We are up a tree," said Randolph, lamely.

"Thanks to your energy enslaver," replied Elsie, with a suspicion of acerbity in her voice, "we are. If you will assist me to descend I shall be much pleased."

Randolph scrambled down to the ground and Elsie followed. They seated themselves under the apple tree and mused. Elsie was applying her handkerchief to a long scratch on her forehead, and Randolph was pressing his handkerchief against a bruised cheek.

"You need a guardian," at length remarked Elsie, "lest your penchant for new inventions ends in your destruction."

"Take me in charge, Elsie," quickly answered Randolph, "take me for life."

Elsie appeared to be watching the dismantled automobile that was puffing itself out in an ineffectual attempt to surmount a stone wall. Presently she turned to Randolph with shining eyes wherein were mingled tenderness and mirth, and said, "Your proposal at this time, Percy, is as ridiculous as your introduction to me was. Wait until our faces are in a normal condition and then—ask me again."

Nellie's Naughty 'Mobile

Regina Preston

Nellie O'Neil
Had an automobile
With a passion for gasolene oil;
To drink 'twas a slave,
And so bad 'twould behave
All Nellie's enjoyment 'twould spoil.

At each oil and drug store
It would stop at the door
And ne'er budge till you gave it a drink;
Then home 'twould careen—
Oh, that auto was mean—
And it auto be scolded, I think.

How an Automobile Turns a Corner

By Ralph S. Ridder, M. E.

JUST what happens when an automobile turns a corner is not often thought of by its driver, or understood when it is thought of. Should curiosity tempt the interested one to ask how the wheel on the inside of a turn is called upon to travel less rapidly than its mate on the outside thereof, the chances are that the inquirer would be informed that the whole thing was accomplished by "differential gearing." If he asked what that was he would be told it was nothing but a "balance gear." Having been thus enlightened, how much more would he know than when he began his investigation?

What really takes place is this. With the two or more motor equipments there is no problem involved, since each wheel is free to turn to accommodate itself to the prescribed path. With the single motor, however, the problem arises since it cannot be directly geared to the two wheels, so some intermediate device must be supplied to permit of one wheel turning faster than the other, when called upon to do so, as in making a sharp turn or in suddenly veering away from an object, in doing either of which one wheel may almost stop while the other revolves at an accelerated speed.

The accepted device for accomplishing all of this consists in placing upon the rear axle a "balance gear." This is an old scheme originally used in paper mills to maintain an even tension on the paper as the diameter of the rolls upon which it winds steadily increases. Tricycles were constructed twenty years ago with this same differential gear.

The principle consists in cutting the driving axle in two, and then rigidly attaching the wheels to its outer ends. The inner ends of the axle have two beveled gears rigidly attached to them and facing each other; a smaller bevel gear or pinion meshes in the teeth of both, and thereby connects them; this pinion is free to revolve on a short stud contained in the cast iron case that surrounds the gears; on the outer edge of the case are the ordinary spur teeth, into which mesh those of the pinion on the armature shaft.

So long as the vehicle is on a straight track and both wheels are free to revolve at the same speed, the case which contains the gear rotates, and the bevel simply acts like a "dog" or clutch to drive both gears and their axles alike, but the instant one wheel is

called upon to travel a shorter path than the other one, the bevel pinion slowly rotates on its stud at a speed representing the difference of these paths; if one wheel stops the other continues to rotate and the pinion revolves around the faces of the gears at one-half the rate of the moving wheel.

If the vehicle be lifted from the ground and one wheel turned by hand the other wheel will revolve at the same speed, but in an opposite direction, the armature and gear case in the meanwhile remaining stationary. Thus it will at once be seen the requisite flexibility of movement is surely realized. A mechanical objection to this method is, of course, the undesirability of cutting the axle in two with the additional weight and difficulty necessarily introduced to provide suitable bearings. The ratio of gearing is usually 1 to 10, but varies from 1 to 8 to 1 to 14.

Perhaps in the much condensed explanation above I have not succeeded in making entirely plain just what happens when an automobile turns a corner, but if I have not, it is because it is extremely difficult without the aid of illustrations to write an explanation of a mechanical contrivance for those who are in the main without either mechanical training or aptitude.



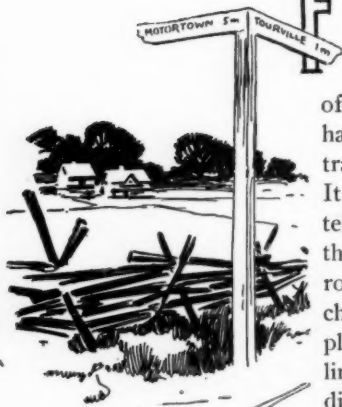
LAYING STEEL ROAD IN
MURRAY STREET

Similarity Between Autos and Husbands

"Buying an auto seems to me very much like getting a husband," quoth Amaryllis, after she had listened to the song of the forty-seventh show attendant, each one of whom had told her there was only one reliable automobile, and that one was the one his concern made. "If done in haste it may be repented at leisure. But of the two investments the automobile is the least risky. If it is ugly it can be made over; when it gets shabby it can be repainted; if one tires of it it can be sold for something. But one can't dispose of a husband in any of these ways."

Touring by Motor

By Robert Bruce



FOR the automobilist who, having come to a mastery of his machine, discovers within himself a desire for new worlds to conquer, there arrives a new and interesting plane of experience. He bids adieu to much that he has been accustomed to in other forms of travel, and takes up a round of new things. It is first of all a far step from the innate intelligence and companionship of the horse to the mute power and mere possession of the road motor. To accustom one's self to the change—with the radius of operation multiplied in the process—may often call for preliminary mental discipline, as well as for additional practice of the more tangible sort.

This is due in large part to the greater demands made upon the operator of an automobile. One may share the ecstasies and the dangers of a trip with a fleet four-footer, relax attention now and then; feel that the responsibilities of the journey are not wholly his, and trust to a discriminating sense in avoiding the perils of street and highway too clever to be merely automatic. But the power-driven vehicle is wholly and directly in the care of the person at the wheel or lever. So long as all goes well, he is the most independent and the most absolute monarch locomotion ever produced, for even the railroad engineer with the right of way in his pocket is subject to "orders" and signals. But when anything serious happens to the lone motorist, no wayside beggar is, for the time being, so poor or so helpless. Nowhere else is the personal equation of such large relative importance.

Recognizing these essential qualifications, and working in league with them, rather than in ignorance or recklessness ignoring them, many special benefits at once appear. One has at his command a means of far-and-wide travel more rapid than bicycling, more exhilarating than carriage driving and—so far as operating cost is concerned—less expensive than railway transportation. The automobile has all the open air advantages of the summer trolley car, but is independent of rails, while the touring party is a matter of the owner's own choice, rather than a matter of business to a

transit company. And the only limitations are those general ones of good roads, fair weather and time.

Travelers by motor have unexcelled opportunities for the study of nature and places, and for sightseeing in general. They are independent of schedule times, and need not hasten from that which satisfies, or stay when interest flags. Their movements are practically unrelated to those of other men, and their progress is unimpeded by any of the common annoyances which threaten the comfort and convenience of other travelers. Wherever the tourist guides his automobile, by copse or cliff, in modern village or through ancient town, midst abbey ruins or along secluded valleys, on the borders of lake or mountain tarn, by the side of fringed streams, along gloomy defiles, or to some quiet seaside resort, he cannot fail to be benefited physically and mentally by the ever-changing environment of his holiday. The ocean side always possesses a keen interest for tourists from the large cities, and from the inland country generally. The curling surf melting into the emerald sea, the stranded fishing-boats, and all the paraphernalia of seafaring life, with the seasoned old boatmen, make impressive pictures long to be remembered.

To be enjoyed to the full, a long journey needs a few preliminary runs, if necessary alone, but better in company with others, since companionship and conversation tend to an even pace and more interesting miles. These preparatory runs are especially desirable if one's vacation be taken in the spring. To come directly from a northern winter's inactivity to a week or month's continuous outdoor exercise is not always wise. The man who can go and come from business on his vehicle more or less regularly through the year is perhaps the best fixed of all in this respect; he is always ready, and needs only to arrange for his absence.

PLANNING THE ROUTE

To lay out an automobile tour, first determine upon a route through a section of country sure to yield sufficient interest and variety to pay for the time, work and expense involved. If this has been covered by some responsible party and maps and descriptions published, procure same, and use for general information and for suggestions. But no matter how many helps one has, he should travel by his own intuition, aided by a preliminary sketch, penciled from the most acceptable map available. Then, from this map and all other sources of information combined, make entries beforehand

in a convenient sized notebook of the principal towns and villages passed through or by, with the main distances of each from the starting point; and in a parallel column the approximate distances between the principal intermediate points. This will provide a daily, working memorandum, giving possible stopping places for meals and lodging. More detail than this is not necessary, but optional with the tourist, who will soon discover that he can safely leave a great deal to be determined in the course of the trip. After each entry it is well to leave sufficient space for remarks, carefully avoiding, however, any not "fit to print."

It will usually be found that such tours and maps as appear in the newspapers, magazines and other publications are more suggestive of touring possibilities in any section than reliable detail guides thereto. Those reading from some large city like New York, Philadelphia or Boston, are naturally seen from such viewpoint; yet anyone living along the Hudson, in Connecticut, Massachusetts or Vermont, or in New York State, or for that matter in New Jersey or Eastern Pennsylvania, can easily make them fit his own case, by planning to join the stated route at the nearest point from his home.

When it happens that one wishes to make an automobile trip between two points not likely ever to be connected by a separate narrative as, for instance, from Mechanicville, north by west from Troy, N. Y., to Little Falls, in the Mohawk Valley, or from Harrison, N. J., to Tarrytown, N. Y., a little careful thought will bring the existing information to his use. It will be necessary only to find out what main, published routes take in each of the two places, and then to plan to use the essential part of both. From Mechanicville, one should find the way to Schenectady, from whence the regular Albany-Mohawk Valley route will lead directly into Little Falls. Likewise, one starting from Harrison, N. J., would strike the Newark-Jersey City-New York line, thence by the regular route up the Hudson to Tarrytown, with reliable published descriptions and maps all the way. Figuring this way, practically all of the North Atlantic seaboard, at least, is already available. As a rule, then, each person should work out for himself the best way to get from his home to the line laid down for some tour which he is anxious to undertake. Then using the description or some of the maps already published, he will have a very practical suggestion of the best roads open to him.

The motor vehicle already in satisfactory every-day service is ready for any ordinary tour after a careful inspection, especially of the motive parts and tires. It is well not only to do this personally, but also to have a competent chauffeur or repairer do it, as a double safeguard. Opinions differ as to what should be included in the tool chest, many tourists being content to go along with what is provided for them when the machine is purchased. Sufficient wrenches are supposed to go with the car, but the addition of a larger "pipe" wrench is worth while. A hammer, screw drivers, cutting pliers and a file ought to be included in the equipment; also a small vise for use in the emergency which sooner or later is sure to arrive.

A goodly supply of nuts, bolts and split pins will be carried, and care should be taken to replace them as fast as used. Spare sparking plugs, valves and valve springs, ready cut packings, cloths and cotton waste will come in handily sooner or later. Lubricants should consist of an oil can and grease injector, with an ample reserve of oil, grease, graphite, resin, French chalk and kerosene, all of which ought to be kept apart from the tools. Screw top cans make the best receptacles for these things. If belts are used, castor oil or specially prepared belt dressing should be included. The gasoline tank should, of course, be filled full at the start, and care taken thereafter to replenish it on the road well ahead of exhaustion, for, though almost universally procurable, the exception to the rule and the stranded machine will connect on the slightest provocation.

It is well to go over all wire connections and make sure that they are all in good working order, as a loose wire is likely to give an irregular current, especially under vibration, and lead to a skipping of explosions. In case of ignition by battery, the safest way is to use one fresh from the charging station, with an additional battery wired for use in case of the first one giving out from any cause. The additional battery may be wired to the first one, and the circuit broken by the use of a simple switch.

The operator and each passenger need one suit of good warm clothing, at any season of the year, with woolen underclothing, and of course, a top coat. The reserve suit, underclothing, toilet articles and miscellaneous belongings may go in one dress suit a piece, to be carried along in the vehicle or, in special cases with a known itinerary, sent ahead by express. As a rule, however, it is better to limit one's baggage to that which can be carried. Not only will

this be ordinarily sufficient, but it will obviate the necessity of shipping and looking it up at the start and finish of the run, respectively. A rain-coat and duster will both be carried as a matter of course, with an oilcloth cover for the vehicle optional, but worth while if it can conveniently be taken. The goggles, hats, caps and other accessories used around home will serve very well for the road.

VALUE OF PRACTICAL KNOWLEDGE

The intelligent use of an automobile for distance work on the road—which means getting the most out of it at the least expense of care and muscle, and without injury to the machine—calls for more than a familiarity with routes and road rules—more than a close study of books of instruction in care and management. A good, working knowledge, if not, indeed, a fair technical command of the principles of construction individualized in one's favorite machine, is essential to complete self-confidence; and this is to be gained only at the expense of considerable personal application. This sort of acquaintance not only tends to a high average or mechanical performance in the course of a tour, but it develops personal enthusiasm as nothing else could do.

One must learn to be his own mechanic as well as his own chauffeur—at times at least—if he would not become at some time or other the unhappy victim of the village blacksmith along the great highway. The hundred-dollar bicycle could stand a few blows on the countryman's anvil, for its construction was comparatively simple and the few essential parts strong. But hardly so protected the high-priced motor vehicle, whose vital parts are full of mystery to the common bungler. The bicycle finally became very nearly "fool-proof"; but the automobile is not now and probably never will be made so.

As a matter of experience, the breakdown rarely comes inside the city limits, with a well-equipped repair shop within walking distance; but almost invariably half-way on the road to or from Nowhere. Unless it be a simple matter, like the repair of a punctured tire—with facilities rather than personal assistance needed—it is usually better to ship the machine back to town if one cannot either do the work himself or direct some one else how to do it. The right sort of knowledge, backed up by the ability to put it into practice in an emergency, means additional comfort and money saved on every long trip. An ounce of "know how" is worth a pound of profanity when the pinch comes.

It is noticed that some automobilists get through a tour in the most comfortable and enjoyable way, while others manage to spoil their journey for themselves or others, or both. The two indispensable qualifications are tact and contrivance. One tactful person doing everything in the right way at the right time, picking up valuable bits of information from those he comes in contact with, having the faculty of securing a comfortable room at a crowded country hotel, and the like, brings enjoyment into a journey when the opposite sort of person would spoil it entirely. Happily for the whole party if the host possess this priceless disposition, for he will impart it also to his guests. The other part is contrivance—the useful faculty for one thing, of taking along what will be needed and leaving the rest at home. Experience teaches how much to take and what, if any, to have sent on. A good bump of contrivance, aided by common sense, will bring hope out of calamity at a moment's notice. The item of baggage is only a part of it, as all the arrangements from day to day need the same happy frame of mind and spirit to carry them through with the largest amount of pleasure and no difference of opinion worth the name.

From all indications, touring will be indulged in more this coming season than ever before. The increase in the number of automobile owners within the past year has been so marked that this in itself will swell the ranks of road riders. Apart from this, however, there seems to be a sort of universal public interest in the road performances of automobiles, and tours long and short are being planned wherever motorists meet all over the land. There exists in most men and women, along with an intuitive love of outdoor life, a genuine liking for mechanics and a penchant for travel. One of the most fascinating features to the beginner is the mowing down of the miles, and one accustomed only to the slower progress of the horse can scarcely believe that he has traversed the distance actually covered.

Anyone who wishes to get the most out of his week or two



LATEST IN FACE MASKS

of overland travel, both in health and pleasure, will find an automobile tour superior to any other means. Nothing so completely takes the mind from business; the automobile demands and will have all the attention that is not absorbed by the scenery or circumstances of the trip; business and the ordinary cares of life are quite forgotten. To some the opportunity comes to make tours in foreign lands, which is the *edition de luxe* of touring to an American motorist. The historic places of the Old World are thus brought nearer to all. Pilgrims to Europe will return with minds full of romance, hearts filled with new vigor, cameras crowded with snapshots, and withal a determination to vote and work for better roads in the United States.

Two and Some Trouble

The girl in the new fangled vehicle flushed slightly as the machine flashed past her home. "Mr. Dash-Dash," she said coldly, "I thought I asked you to stop and let me out here."

"I beg your pardon for what must seem like my rudeness," drawled her companion. "I assure you that it was my intention to let you out, but circumstances have come up over which I have no control. I realized some time ago that I did not know how to handle this machine, but there is no cause for alarm, as the steering apparatus is working beautifully. Kindly lean over to this side when we turn the next corner. We are going at too fast a pace to jump, of course, so I must request you to remain where you are until the gasoline is exhausted. How long will that take? Well, I should judge that it will last from six to seven hours, consequently we will get home about 3 o'clock in the morning."

Using the Wrench

A monkey-wrench, although a most serviceable article in itself, is a very instrument of destruction in the hands of a careless novice. A wrench should be used to occasionally run over the various nuts and see if all is tight and trim, but to be everlastingly tinkering with a vehicle or its motor, as some people seem unable to refrain from doing, is ruination to the nuts, threads and wrench, and means that when it is absolutely necessary to shift a screw, the wear on the sides of the nut makes this quite impossible. Use a wrench rationally and carefully, or else don't have one at all.

On an Ostrich Farm

AT first thought, there seemed to be a bit of incongruity between an automobile and an ostrich, but sober second thought and the accompanying illustration will at once convince you that your first idea was incorrect. The gentleman shown in the Oldsmobile is Mr. Edwin Cawston, the pioneer American ostrich farmer. Sixteen years ago Mr. Cawston went to Africa, captured fifty ostriches and brought them to Galveston in a special steamer. Then he transported the birds by rail from Galveston to Pasadena, California, where the first ostrich ranch was started, and where it still remains. That a man far-seeing enough to have brought over a shipload of native Africans to grow feathers for



him should have been quick to appreciate the automobile, is but natural, and so it comes to pass that all of the traveling Mr. Cawston has to do in and around his ranch is now done by the quick moving vehicle here shown, to whose presence the bird famous more for the beauty of its plumage than for its wisdom, has still quite enough of the latter to become entirely reconciled to.

One of Its Advantages

"Is there less danger in keeping an automobile than a horse and carriage?"

"There seems to be, if you have marriageable daughters. It isn't fashionable yet to elope with a chauffeur."

Efficiency and Cylinder Temperature

By Peter B. Penelope, C. E.

BOTH efficiency and power are directly related to cylinder temperature, as partial effects to cause. The nature of the interaction will be readily understood if the terms are explained. Technically defined, efficiency is the ratio of the heat converted into work to the total heat imparted to the engine. The total heat units accounted for by the indicator diagram, or by the brake results, show what has been turned into work; while the difference between these and the total heat-units given in the form of fuel state the losses in that conversion.

The greatest source of heat-loss arises from the cooling of the explosion gases by contact with the cylinder walls and piston. Hence the higher the temperature of these latter the lower their cooling effect. High cylinder temperature, therefore, conduces to efficiency.

There is naturally a limit, but it is not here necessary to inquire why and when the limit of temperature comes into play. For practical purposes it is sufficient that, within the range of permissible temperatures, the hotter the cylinder the better the efficiency. In the case of power different conditions are required. Power is the conversion of heat into work. The conception stops here. It does not include heat-loss or heat-cost.

How many thermal units are wasted, or how much fuel is expended, in producing this result, is beyond the strict range of the term. Consideration is confined solely to the production of energy. In the case of the internal combustion engine it is evident that, other conditions being alike, the more charge is included in a cylinder of given dimensions the more power will be produced by the explosion.

Thus power depends on the weight of the charge. Now one charge having half the absolute temperature of another will have double its weight, and its explosion will generate proportionately greater power. Low charge temperature, therefore, increases power. But it is largely by contact with the hot cylinder walls and piston that the incoming charge is heated, so that the lower the temperature of the former the better the condition for power production.

In connection with cylinder temperature Professor Hele-Shaw, at the International Engineering Congress, at Glasgow, presented

a summary of power tests, confirmatory of the above. The series of experiments showed that in a motor with cylinder cooling water ranging from 77° F. to 250° F., there was with increase of temperature a gradual decrease of power, extending from 4.775 b.h.p. to 3.94 b.h.p. It cannot be said that these results brought to light any new fact hitherto unknown; nor, from the omission to note the engine-speed or the quantity of water circulated, have the figures more than a relative character. But they are an interesting illustration of the value of low-cylinder temperature for power production.

Under the condition of limited water supply, therefore, the owner of an automobile who has power rather than efficiency in view may do well to use the rapid and effective forced, rather than the slow and less efficient natural, circulation of water for cylinder cooling. The somewhat antagonistic requirements of efficiency and power, under the aspect here considered, would best be met by compressing in a cool chamber, transferring, fixing, and expanding in a hot one.

Evolution of the Pneumatic

By James R. Nevins

TO most of those who to-day use and own an automobile, the pneumatic tire, upon which so much of their safety and comfort depends, is a sort of India rubber Topsey—"it jess' growed." The conception, birth and up-bringing of the air-filled tire being a thing about which the newer generation knows little, if anything.

From an American viewpoint, it was at the 1892 National Cycle Show—the second regular one to be held in this country—that the subject of pneumatic tires first attracted quite as much public attention as did the bicycles shown. It was then the attention of everyone interested in cycling was irresistibly drawn to the new invention, which bid far to revolutionize the business, and very shortly thereafter did so.

Inventors had been hard at work "perfecting" the most unheard-of and unlikely-looking tires, and the cycle show was looked on as a fitting opportunity to display them to an admiring world. Therefore, about every third stand held a tire inventor, each one enthusiastic over the possibilities of his tire, and never weary of explaining its beauties to the onlookers.

The previous year had witnessed the appearance on quite an extensive scale of the original "rag" tire—the Dunlop—and in

spite of its manifold drawbacks, its performances had been such a revelation that riders everywhere were wild over it. It was then time for the American improvers to get to work and do their share in forwarding the movement. In 1892 such tires as the Tillinghast and Columbia hosepipes, the Thomas "rag" tire, the G. & J. detachable, the Morgan & Wright, and a number of other equally well-known tires were first extensively marketed. These and a host of others were seen at the cycle show of that year, and as they were all, or nearly all, new, there was no lack of careful examination.

The task of separating the wheat from the chaff was no inconsiderable one. Along with the few that were to survive were a much greater number of tires that had little real merit or were entirely impracticable; but at that stage of horseless transport, no one possessed the knowledge requisite to pick out one from the other. Of course, the great bugbear was the liability to puncture, and a very large number of inventors had turned their attention to lessening, or even stopping, that very disagreeable liability. Various devices were employed, but there was an inclination to look upon them all with suspicion, it being held that possibility of puncture and resiliency went hand-in-hand. Still, there were people who took the opposite view, and pinned their faith to such tires.

One of the strangest parts of it all was that the feature most earnestly desired in these early days—the ability to resist puncture—is the one that is least thought of now. At that time inventors did not seem to realize that unpuncturability was only to be obtained by the sacrifice of resiliency, and that the latter would never be approved by the users of the new tires. When finally all had become convinced of this, the efforts to make tires of this kind practically ceased.

It is rather curious that, while most of the leading tires in use to-day by automobilists are the direct descendants of those smaller cycle ones which made their appearance at that show, yet the years 1892 and 1893 may be said to have been the most prolific in the history of tire inventions. The tires that have survived covered the ground almost completely, yet other tires were brought out by the dozen, most of them impracticable and complicated to the last degree. But so keen was the interest in the new tire, and so willing were the public to experiment, that the "freaks" were almost all made welcome.

Of course, the phase was but a passing one. Ere long the many "freaks" had received their trial, and, being almost universally found wanting, were discarded. Yet, it was not until several years later that new ones ceased to be launched, and the tire trade settled down to well known lines. An immense amount of money was spent on the mushroom tires, not only by the trade, but by the riders as well, all of which was utterly wasted.

Through the experience thus gained, however, the automobilist owes his comparative freedom from freak and experimental tires. Wherever the firms who learned the science of tire-making back in '91 and '92 offered the automobilist a pneumatic, the buyer got full value received, and wherever he purchased tires from concerns who had not thus been well grounded in tire-making, the purchaser in most cases regretted his ill-chosen experiment.

When Spring Came

By Edith Jane Sanford

IT was one day in the early spring that his mind refused to work. It did not "strike," like an affronted drudge; but it went away altogether, leaving a flimsy wreath on the air, a track or two in the sand.

There was the man with all his proper members, having apparently suffered no bodily hurt; yet the informing principle of him was gone. He had always owned more than enough energy.

People had a habit of boring him, and still he was too robust to refuse any outlay even insolently demanded. Hitherto he had been able to meet men and women on their own ground, toss and catch a missile of debate—and forget them. He could easily brush aside their aura, and yawn away the memory of it in happy solitude. He had given them something they were inclined to value. It cost him little.

Now he grew penurious, for he had nothing more to give. Their banter beat upon him and hurt; he had no defences. He looked pathetically about for answers to dull questions, and found no more than yes and no. The little hooks in his brain had always seemed to leap forward in their eagerness to fasten; now they drooped and hung. It was as if his own familiar weapon, a sword fashioned for swift service, had turned into a willow wand.

He had been used to seek out crowds, in his best estate, because they gave him a vague exhilaration. Suddenly it became a

strange new torture to meet his fellows in the street. Their motion struck upon his eyeballs and hurt. He seemed to be forcing his way through human films. He was disinclined to walk fast or far, and grew short breasted—with apprehension, so he thought. And having, in a moment of panic, told all this to a doctor, as a physical experience, the doctor told him in turn that he was tired. He had used up his capital. He had no more to spend.

Then he was hidden to "loaf," and with some surprise at an ignoble situation, took the big touring car he had heretofore only used to rush from his office to the Hyphen Hotel, or maybe through the park, or out the Riverside Drive, and in it journeyed to a farm surrounded by meadows with a willow-shaded stream flowing through and an upland pasture to the west. The first day he was briefly interested in the brownish grass of the dooryard, invaded by green, like color oozing out of the sod. The willows "down the road" were yellow. The mud smelled like spring, and Chanticleer blew his horn. The place seemed to him a great museum of loneliness. He felt cut off from a life no longer significant, its edges already blurred by that disconcerting strangeness in his brain, and as yet no other life had taken its place. He was floating between two worlds—and all the time doggedly eating eggs and cream, and trying at night to keep those wheels inside his skull from clacking round in that purposeless way they had of late.

But on a morning when the sun was dispersing clouds too airy to throw a shadow, he put the lever on the low speed notch and slowly climbed the rough hill road until he came out in the upland pasture. Immediately, for some reason, or because the moment was ripe, his shackles fell from him and his eyes were opened. There was, indeed, no reason for any happening save that the moment had struck, and so he at once perceived, as he sat in the big high-backed seat and the motor safely throbbing beneath him, the air lay warm upon him, and the smell of the earth was in his nostrils.

Almost unconsciously he threw in the clutch and moved slowly on into the pine woods, and stopped there, his face near to a moving bough. Something awakened within him. He could have told what the scent recalled, and yet, since there was no one by to demand a foolish interchange of comparison, he need say nothing. His soul, and he knew that same whiff of balm bore him back to a pine-shaded bank in the pasture at home, where violets came in

the spring. So, grasping with both hands the globe of remembrance, he was the child again, the man comprehending the child.

There was no need of going into the great wild woods, far from men, for that life of nature which complements the soul. This, also, was primal nature, though in little. All the joys and tragedies of tiny wild life were at once apparent to him. He thought with love and gentleness of the nests that were building. Some of them would be washed away or wantonly destroyed; but it did not matter. Each little feathered thing threw its whole life and labor into an uncomprehended scheme, and was glad to do it.

He looked at the pine trees and wondered which one of them would be cut down or seamed by lightning; for his own hurt made him kin to loss. But it did not matter. The stricken thing would be received into the common bosom, and lie there to enrich the rest. Other springs would be as fair, and yet more poignant for such tragedies; and the tragedies themselves were not forgotten. Everything was recorded in the voiceless chronicles of the air.

While he was uplifted by the sanity and wholesomeness of the place, he was at the same time reconciled to his own maimed state. He was entranced by the sequence of things; he was caught in their rhythm. It became impossible to believe that any work of creation should be other than very good. Colors, like an exhalation, rose to his eyes and blessed them.

There was last year's mullein, yellow and brown in a velvet harmony. There were the soniber pines, less a hue than a shadow. Birches flickered in liquid green. His heart sang within him, and



presently he began to smile, for he saw a caterpillar crawling away to some unknown goal, and it seemed excellent fooling for that animated radiating coil to be making such ado in getting nowhere.

The fardels of his former life fell from the man like Christian's pack. Unregarding friendship, love unkind, what were they, after all, to the soul? It was impossible any more to clinch and cling, even for his dearest wish. All wishes became an acquiescence. He wafted a light goodby to passions that a week ago had challenged heaven to dare dispute their own continuance. They were not less poignant, but life had suddenly become greater than any expression of life.

He had fallen into that frame of mind which counsels, not an onslaught upon the heights, but grave, long pauses before normal doings. This was the first day. The second brought new balm and told him how to put it to his wounds and heal them. May flooded in on him, a sea of green, and on that his shallop floated merrily. Yet not to former ports, nor within sound of the singing old breakers. He had learned something not to be forgotten. He had been born again.

And the big car, as though imbued with the new life of him who guided it, moved homeward softly singing a low, droning, restful song far different from the fierce, exultant one of other days.

To Good Intention Avenue

From early morn till dewy eve,
Scarce stopping for a meal,
Through streets and roads the scorcher sped,
Driving an automobile.

At last he flew to realms above,
But there—oh, sad, sad fate!—
He found a sign, "No fools allowed,"
A-hanging on the gate.

"Oh, let me in, kind saint!" he cried;
But Peter said, "No, no!"
You've bought your car; if you must ride,
There's a cinder path below."

How a Boy Built an Automobile

By Ralph R. Tester

I SUPPOSE I was in no wise different from a million of other American boys in my desire to own an automobile, nor do I imagine my father was materially different from the fathers of that million or more when he declined to transfer a thousand dollars from his pocket to that of an automobile manufacturer, so my desire for a self-moving vehicle might be gratified.

I first became possessed with the determination to own an automobile about two years ago. I was then ten years old and attending school, so really outside of the determination above noted the probability of my speedily becoming an automobilist was not very great. While knocking around my father's factory one day I came across an old gasoline engine which had been cast aside as having outlived its usefulness. I asked my father if he would give it to me, and he very generously did so.

After this, every moment I had to myself I devoted to studying the anatomy of that motor, and soon I had mastered all the mysteries thereof, and so doctored it up that it really ran almost as well as it ever did. When this was finally ac-

complished I announced my intention to build an automobile around that motor. My announcement was met with considerable reserve, but that only made me all the more determined to build the vehicle, and to build it, too, without either help or suggestion from anyone else.

At the end of four months of hard work I climbed into the seat of the vehicle you see here, called on that o'd motor to do its duty, and sailed off down the street just as though I had never done anything else in all my life. I suppose I was a bit elated over my debut as an automobile manufacturer, but all things considered I believe I had some occasion to be.

You will notice the feet of my idol are of clay. That is to say, the wheels of the carriage are not exactly what they should be, but they were the only kind which came within my reach, so I made



a virtue of necessity and used them. In their favor it may be said that I have never had a tire trouble of any kind.

Going into the details: the motor develops about 2 H. P. when it wants to, and is equipped with chain transmission and clutch. The steering is such as is usually employed in vehicles of its class, while three levers give the user complete control of the vehicle at all times. I cannot boast of the hill-climbing powers of my carriage because you see I have only one speed, and while with it I can do about 14 miles within the hour on fairly level roads, I do considerable less on hills; in fact, on some of them I don't do anything at all but stop.

In conclusion let me say that there are better automobiles than mine, but there are none the owner of which can any more truthfully say "it is all mine."

Riches in Sight

THE beautiful young girl flung herself at her stern father's feet. "Oh, father," she moaned, "why withhold your consent? Jack and I love each other dearly. Why should you wreck the happiness of two lives by not permitting our marriage?"

"Girl," the old man replied harshly, "you know full well that although considered wealthy, I am in reality tottering on the verge of ruin. The only hope I have of retrieving my fortunes is the possibility of your making a good match. You know this, and still you persist in pleading for that beggar, Jack Austin. No, you shall never marry him, so make up your mind on't, girl."

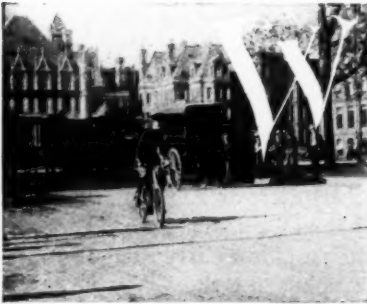
"But, father," she cried, "are you not too severe? Jack's prospects are of the brightest. To-morrow he starts in business for himself. He will open an automobile repair and storage station, and"——

"What, girl! Say you so? An automobile repair shop? Faith, this was never mentioned to me before. He'll grow as rich as Croesus. Yes, my darling, you can marry him, and this very day if he will. Your old father will save himself yet. And to think I nearly lost him!"

Mary had a motorette once,
'Twas painted white as snow,
Wherever Mary wanted to
That auto wouldn't go.

Is There Money in the Business?

By Rainsford Casey



ITH many people who have but a slight knowledge of the conditions under which the automobile industry exists, who have practically no insight into factory practice, and who cannot, therefore, estimate the cost of production with any degree of accuracy, the question at the beginning of this article may seem to need only one

answer, and that in the affirmative.

When the average man in the street is told that even a comparatively small motor vehicle has cost its owner say \$1,500, he stares in astonishment, and begins to wonder how it is that he is not in the motor trade. If he be remotely connected with machinery, he is too apt to rush into the automobile business with the merest smattering of the subject, and then he finds to his cost that there is money in it—what he puts into it—and that it is extremely likely to stay there.

The fact is that, in its present stage, the gasoline vehicle cannot be made at a profit except by those who have spent time in study and thousands of dollars in costly experiments. Even then the results cannot be looked upon as entirely satisfactory, for there are probably very few trades in which apparent gain may develop into actual loss which are equal to the automobile business. In writing in this fashion, I need only look round at the various companies which have been formed to build automobiles, and gently—very gently—ask about the dividends. It is a delicate subject, I know, but it is one of considerable importance.

In thus encasing the cylinder of enthusiasm with the water jacket of caution, I do not wish it to be supposed that I am desirous of hindering the development of the automobile trade; far from it, since it is to this very development that our business career must look. That in a very few years the automobile trade will be one of the largest industries in the country, no thinking person can dispute, but at the present time it is foolish to experiment without experience.

Providing a company has machinery and capital at its command, there is no reason why that machinery and that money should not be employed in the construction of motor cars; but not in experimenting, which is where the trouble comes in, until all those having control of the factory have had actual automobile experience to guide them.

What such a firm should do, so long as it is lacking the requisite experience, is to decide upon the price of the carriage they intend to build, and then appoint some independent expert to buy them the best Continental car of that price, or about it, which he can suggest. This vehicle should then be taken in hand by responsible people at the factory, and should be driven daily by different individuals, and all its weak points noted. Then the work of designing the proposed car should be proceeded with, without interfering in any way with the main features of the car which is to be copied.

Only detail alterations should be attempted, and improved material and work put in, always, however, keeping in view that the cost of production must be kept down. Proceeding along this plan there is money in the automobile business as it now is, but let no man delude himself with the idea that the automobile is the golden carriage wherein any one may ride at lightning speed to fame and fortune, because it isn't. There are smoother roads to both than the one labeled "for automobiles only."

What the Early Spring Tourist Gets

At 7 A. M.,
 Out comes the sun!
At 8 A. M.,
 The rain's begun!
At 9 A. M.,
 Down beats the snow!
At 10 A. M.,
 The east winds blow!
At dinner time
 It's very cold!
The changes are
 Quite manifold!
And if with them
 You keep in touch
You'll be right in-
 Fluenza's clutch!

"Sinfulness" of Sunday Riding

By Helen Westover Green

THE time of year has come once more when the campaign for what is called "Sabbath observance" may be expected to open; and, indeed, the first gun of that campaign has been fired by a somewhat sensational preacher, pillorying the automobile as the latest example of Sabbath desecration, declaring that "the use of the automobile for pleasure purposes on the Sabbath is sinful." As this assertion doubtless expresses the convictions of a great many worthy people it cannot be dismissed as the utterance of a single fanatic.

We are apt to think that great progress has been made towards bringing about healthier notions about the uses of the first day of the week, and in a measure this is true. Even the most rigid Sabbatarians are compelled by the force of circumstances to join in what their ancestors in Puritanism would have called Sabbath-breaking.

They may make Sunday as gloomy and uncomfortable as they like, but they cannot restore the old conditions. Few of them refuse to ride in the street cars to church; few of them eat cold dinners cooked the day before.

Yet the notion that harmless pleasures are wrong, just because it is Sunday, is far from having disappeared. It exercises a considerable domination over those whose morality in other respects is perhaps none too scrupulous. And it is most in evidence when the weather grows warmer and temptations to spend the day out of doors multiply.

The usual fashion of the Sabbatarian has been followed by the divine who has denounced the automobile. It is "sinful," he says, to ride for pleasure. That the circumstances under which this form of recreation is enjoyed have anything to do with the sinfulness of the act is to such people incomprehensible. Just so people have from time immemorial

"Compounded sins they are inclined to
By damning those they have no mind to."

The man who drives out behind a pair of horses every pleasant Sunday afternoon looks with horror at the desecrator who goes out in a yacht. The yachtsman has no patience with the excursionists who crowd a steamboat bound for some popular resort. One plays a quiet game of tennis on his own lawn and reads

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with a shudder of Sunday baseball. An afternoon walk is proper, but a call on a friend is rank atheism. So each one lays down the law for himself, and makes sins out of the occupations of his neighbors.

The proceeding is thoroughly illogical, and the Sabbatarian never has any logic to offer in defence of it. He "knows what is right"—himself being the final arbiter. He is shocked at "The Continental Sunday," at the happy crowds in Paris or Brussels or Vienna, forgetting that those people are much more faithful as a rule in their church-going than some of his more decorous friends at home. He measures the whole world with his own little foot-rule of propriety.

The question why people do not go to church has been discussed ad nauseam. But it has yet to be shown that the real reason is the love of amusement. In fact, it is hardly an exaggeration to say that Sabbatarianism has done more real harm to religion than all the Sunday excursions that ever were planned. Sunday is the one day in the week that the ordinary man has to himself and his family, and he is going to spend it—particularly during the summer—in some kind of relaxation. As a rule, he will take rational relaxation if he can get it.

In these days when the automobile has widened the scope of a man's outing to dimensions never before even dreamed of, to argue against Sunday automobiling is to enact again the fable of Mrs. Partington's mop and the Atlantic Ocean. When religious bodies denounce such riding as "sinful," they accomplish nothing towards preventing it. No one is afraid of excommunication from lay Popes. But they alienate those who are not naturally irreligious from the religious observances which are inconsistent with such harmless pleasures. And they make actual sin less dreaded by this manufacture of artificial sin.

There are enough real evils in the world without dwelling upon imaginary ones. To travel in an automobile is in itself no more wicked than to walk. Objection may fairly be made to some Sunday automobilists—not because they are automobilists, but because they are disorderly persons. Yet the number of these is very few; the automobile offers no inducements to rowdies and rioters. To denounce the use of it as "sinful" is an abuse of language.

The trouble is, of course, the old one—that religious bodies too often attempt to do by threats what they can succeed in doing only by moral suasion. The exaggerated notion of the value of Sunday

as Sunday divorces religion from life and makes hypocrites and infidels. The church that exacts no rigid conformity on such minor points, but confines itself to the plain enunciation of the faith that means right living, is the only one that in these enlightened days is not an anachronism.

Reviewed by Rothschild

IN the course of a recent address before the Automobile Club of Great Britain and Ireland, Baron H. de Rothschild, the famous French builder, owner, racer and student of automobiles, said:

"In 1900 the importation of motor cars in France was valued at 388,000 francs (or £15,520), and to 780,000 francs (or £31,200) in the first ten months of 1902. In 1900 we exported motor vehicles to the value of 7,259,000 francs (or £290,360). In 1901 the figure rose to 13,414,000 francs (or £536,560), and in 1902 the motor cars exported amounted to the considerable value of 26,551,000 francs (or £1,062,040). This short statistic is more eloquent than the longest dissertation.

"I should explain that in these returns the value of the vehicle is estimated by its weight. The value is calculated on the basis of 10 francs (or 8s.) the kilogramme (of 22,046 pounds avoirdupois), which is often greatly inferior to the selling price. Thus a car weighing 500 kilogs. would cost 5,000 francs (or £200), and one of 750 kilogs., 7,500 francs (or £300), and so on. The cars weighing 1,000 kilogs., and the racing vehicles are often sold on the basis of 15 to 20 francs (12s. to 16s.) the kilog.

"There are fifty-three firms in Paris manufacturing underframes and motors, and seventeen in the provinces. The production of these firms for the year 1902 totalled 12,000 cars, in the construction of which 45,000 workmen were employed. There are about three times this number of men engaged in the other departments of the industry, such as the forges, steel works, foundries, works producing axles and springs, tire factories, carriage building shops, carriage upholsterers, tanneries, lantern makers, etc., etc. The total number of men engaged in the industry would thus reach about 180,000. Each workman earns on an average £72 a year.

The manufacture of pneumatic tires also deserves a passing mention. We have in France two principal firms, the Société Michelin, who in 1902 manufactured 15 000,000 francs (or £600,000)

of tires, and the Société Continentale (a German company) whose sales amounted to about 3,000,000 francs (or £120,000). Each of these concerns has about 2,000,000 francs (or £80,000) worth of goods in the charge of agents.

"You will see, from these figures, that the automobile industry in France has truly become a national industry. If it has attained that character, or, rather, that quality, in my own country, it is due principally to the stimulating influence of racing. For my own part, I am absolutely convinced that motor car races are not only of great utility, but that it is owing to them that French automobilism has been able to make such remarkable strides during the past few years. The makers would never have consented to go to such an enormous expense, to impose upon themselves such great efforts and huge sacrifices for ordinary customers as they have been called upon to make in order to compete with each other and build up a reputation in races. They have succeeded in building vehicles to withstand enormous strains and capable of traveling at 77 miles an hour. Racing has, therefore, a great advantage, not only in the way of increasing speeds, but more especially in perfecting the construction of vehicles.

"And now, as a medical man, I would remind you simply of the well-known axiom, which applies so well to sports as to other things, that any excess is an abuse, and that as soon as a feeling of fatigue follows upon the exercise of a sport you may be sure that there has been too much of it.

"According to the physical condition of individuals what is an excess for one may not be an excess for others. A ride in a motor car of two hours in the morning and of three hours in the afternoon constitutes an exercise which is not only very agreeable, but is not likely to cause fatigue. With a sufficiently long sleep of, say, seven or eight hours, a man can easily ride five or six hours in an automobile daily, without feeling any sense of lassitude. But if you exceed a speed of thirty miles an hour, it is not advisable to drive more than four or five hours a day, for under these conditions the excess manifests itself in a sort of cerebral fatigue, caused by the continual concentration of the mind. This kind of fatigue should above all be avoided, for it has the inevitable result of enfeebling the will, which thus becomes less capable of guarding against imprudence.

"I would not advise any one to undertake journeys, as I have done myself, of 464 miles in a day, starting at four o'clock in the

morning and arriving at ten o'clock at night at Stuttgart; or leave Paris after lunch at two o'clock and arrive at Calais for dinner; or leave Paris in the morning and lunch at Trouville, a distance of 149 miles, and return to Paris in the evening for dinner. But if automobilism is practiced moderately, without excessive speeds, it can produce the most beneficial effects. A complaint which is very prevalent among certain classes nowadays, and is capable of having serious consequences for those afflicted with this nervous dishonor, is neurasthenia, and this has on several occasions been entirely cured by motor car rides at regular and frequent intervals. Hypochondria, and certain affections usually subjected to the air cure, can be treated in the same fashion."

New Way to Sell Old Horses

By the Man Who Bought One

"DID you know they have a new market for broken down and broken up, crippled, aged and generally worn out horses on Long Island?"

The question was asked by a well-known railroad magnate, as he stepped from his big touring car to enter the Waldorf.

"Well, they have," he said, answering his own question. "And the prices realized for spavined, ringboned, wind-broken old plugs is far higher than was ever dreamed of in the days when every Long Island City block had its factory where imported bologna was turned out by the ton to supply the free-lunch counter demand. I believe Manhattan does an immense trade in supplying this new market with the live animals. No dressed horse is purchased over there. It must be alive when taken there, though the nearer dead the better it suits the buyers—the commission men, as it were.

"The market seems to have its center in Jamaica, though every road over which an automobile may pass has its specialists in this hippo cripple trade.

"Manhattanites with automobiles are the purchasers of the product, and singularly enough they never care to take what they buy.

As I said, Jamaica seems to be the center of the industry. Fulton street, from Pettit's Hotel, where every automobile stops, clear to Queens, is lined on both sides day and night with the con-foundedest, scrubbiest lot of scarecrows and candidates for the glue

factory that were ever assembled outside of famine districts. Where they all came from I can't tell. Manhattan must supply them, for all Long Island couldn't furnish a day's quota in ten years.

"These lame, halt and blind creatures are hitched to any sort of an old cart, the more ramshackle the better the trader is pleased. Sometimes the animals are so near death that the owners have to stand with their shoulders against them to keep them from falling.

"So soon as an automobile leaves Pettit's for Queens, or Hollis, business begins. One by one the horse dealers, who have been holding up their steeds, push them over in front of the automobile, or as near to the machine as they can get.

"Then small, but industrious boys, stir up such animals as have any life left, and harness, wagons and carts seem all to fall to pieces at once, like the celebrated 'One Hoss Shay.'

"By the time the automobile has gone half a mile, Fulton street looks as if a cyclone had been wrestling with a wagon train.

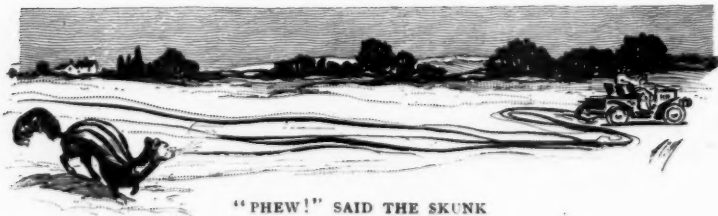
"Then the traders in moribund horseflesh succeed in stopping the automobile and begin to put in their claims. According to their story, the Blue Grass State never produced half as many Morgans, Hambletonians and other fine grades in equinity as had just before been assembled on Fulton street.

"By the time you have disbursed all your check book, the traders nearest Pettit's have already procured a new stock, and are prepared to do business with the next automobilists.

"I've been long enough in the claims department of railroading to know how an acorn fed, razor-back hog is transformed into a corn and sour milk Berkshire by the simple action of a locomotive, but I'll be hanged if I ever saw such rapid transit improvement in the breed of horses as is to be witnessed daily in Jamaica."

And as the flushed automobilist made for the café he looked as if four high balls were about his size.

Jealousy

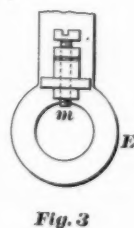
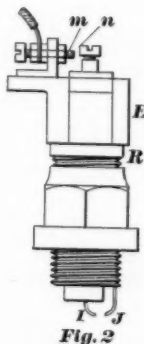
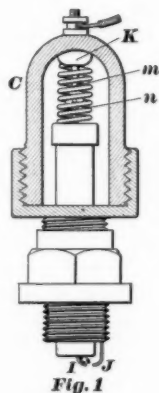


"PHEW!" SAID THE SKUNK

A Soot Defying Plug

By Paul E. Duncan

AN ugly plug and a plug ugly are two things to be avoided by the automobilist whenever such avoidance is possible. In the use of the explosive engine, it is very much easier to free oneself of the presence of the plug ugly than of the ugly plug, even admitting the ease with which one becomes "sooted" with it. It seems, however, as though the contemptuous reign of the former is to be shortened, owing to the lucky accident in which an observant workman in the famous Panhard factory successfully enacted the part of a discoverer. The prime cause of the discovery was a four-cylindere engine, which through over-lubricating, had so fouled the sparking plugs that but one of the four was properly performing



its functions. The fourth plug was plugging away in great shape, despite the fact that it was so deep in the mud of misplaced oil as its three brothers were in the mire thereof.

Now here is where the observant workman makes his bow and discovery. It was this man's sole duty to test the motors in the Panhard and Levassor works, and he had been in the habit of arranging the high tension wire from the coil, which is usually attached to the ends of the sparking plug, in such a way as to leave the end of the wire from one to two-twenty-fifths of an inch, but not attached to the outer, end of the central rod of the plug. The

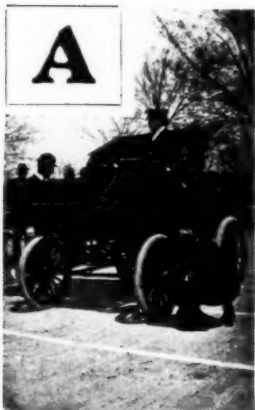
man found that this arrangement afforded him two advantages. In the first place he was able to see if the current was passing properly to the plug, and in the second he benefited by the interesting and hitherto unexplained fact that when the circuit was completed a spark jumped across the gap between the end of the high-tension wire and the central rod of the plug, and also across the platinum points of the latter within the cylinder, however much the points might be sooted or covered with oil.

Upon learning of this M. Baudry de Saunier explained the whole thing in this fashion: The idea consists chiefly in protecting the exposed ends of sparking plugs by means of an ebonite cap C (Fig. 1). Under the top of the cap is fitted a metallic boss K, the cap itself being attached to the sparking plug as shown. A light copper spring connects the boss K with the end of the plug which completes the circuit for the current. One day, upon taking off the ebonite cap from a plug, it was found that the copper spring conductor was absent, but, notwithstanding which the charge in the cylinder to which the apparently faulty plug was fitted, fired perfectly. This was not particularly remarked at the time, as the spark given off by the coil at atmospheric pressure was about 15 mm. in length, and the distance it was required to jump by the absence of the conducting spring was not more than 2 to 3 mm. It was, however, noticed that, no matter how much the particular sparking plug served by this apparently faulty connection was smothered in oil, it sparked as well as ever, while it altogether failed to spark when connected up in the ordinary way. M. de Saunier leaves the explanation of this phenomenon to electricians, but shows by means of the drawings (Figs. 2 and 3) how motor users may adapt their sparking plugs to permit of the oil defying jumping spark. A shaped collar, E, made in ebonite, or in some substance which is a non-conductor of both heat and electricity, is screwed on to the plug as shown. It carries on its projecting arm a small copper angle piece, drilled and tapped to receive the terminal M, to which the high-tension wire from the coil is attached; the terminal should be so made that the point N can be brought to within 1 to 2 mm. of the rod projecting from the end of the plug.

The new arrangement does not, says M. de Saunier in conclusion, in any way increase the power of the engine, but it certainly causes the plug to spark properly, notwithstanding any deposit that may form on it, due to over-lubrication, while it considerably simplifies the work of searching for faults in the ignition circuit.

European Notes

By Alexander F. Sinclair



AMERICAN steam vehicle owners have long wanted a reliable kerosene burner, and from a report issued by Mr. W. Wooley Beaumont on the "hydroleum" burner, it would appear that the article to suit them has arrived. It should, perhaps, be premised that Mr. Beaumont is the eminent authority on automobiles, who exhaustive work on the subject is a book of reference to everyone in this country who can afford to buy it (it costs over ten dollars); and probably no one in Britain could have been selected for carrying through the tests whose report, on account of his extensive knowledge

and absolute integrity, would have carried more weight.

The vehicle on which the burner was tried was a standard pattern Locomobile, and the hydroleum, burning crude Texas oil, was tested in competition with the usual gasoline burner, fitted by the Locomobile Co. The tests consisted of runs on different days over the same road, and approximately under the same weather and road conditions, the hydroleum trial extending to 52 miles, the other to 50 miles. The 52 miles were covered in four hours, and the quantity of Texas oil consumed was just over four gallons—4.03 to be exact—while in the petrol trial the time was 3 hours, 55 minutes, and the quantity $3\frac{1}{2}$ gallons. It is, of course, in the price of fuel that the hydroleum has the advantage, Texas oil costing but two pence (four cents) per gallon, whereas a gallon of petrol cannot be purchased under a shilling (25 cents.)

The cost of running works out on the basis of prices mentioned, at 31 cents per 100 miles for the hydroleum, and \$1.68 per 100 miles when petroleum spirit is used. In a tabulated account of results, Mr. Beaumont enters fully into the details of consumption, not only on the trials mentioned, but of others with the car stationary. The only item of interest to the average steam car owner is the relative water evaporating power of the two fuels, which is found to be 8.86 gallons of water per gallon of petrol, and 8.53 gallons of water per gallon of crude oil, these

being of course the running results. From the foregoing figures it will be seen that one of the advantages which the gasoline motor has hitherto enjoyed over its steam rival, lower cost of operating, will probably be lost to it ere long, and will be found weighing on the other side.

The results of the British tire trials have been awaited with no little interest by many people connected with automobilism in this country. There was a sort of match between the Collier set, which had the best running record, and the second of the four Dunlop sets, which finished second in the running contest, the relative losses of time from all causes during the 4,000 miles covered in 40 days being 48 against 87 minutes. It was known that the judges would give weight to several considerations besides the mere running results, such as the condition of covers and tubes at the termination of the contest, facility of detachment, resiliency and tractive resistance.

The Dunlop set takes first prize of £100, the Collier set second prize of £50, and all the other four sets that finished the distance, three of which were Dunlops and one Maison Talbot, take third prizes of £10. On all points except that of running, the first prize set appears to have had the best of it, according to the judges' report. The condition of the tires and covers was decided from photographs taken during the contest and from a thorough examination at its conclusion. Facility of detachment tests showed that the Dunlop tires were in that respect distinctly superior, a remark which also applies to the results of resiliency and tractive resistance tests by means of the British Association dynamometer.

The Collier Co. will probably console themselves with the reflection that the running record appeals more to the average user than any of the other considerations, but the Dunlop firm take first prize on their merits and will benefit hugely by the contest. The trials have been a big advertisement for British made tires, and since their conclusion the Collier Co. have carried the battle into the enemy's country, and have arranged for the sale of their make on the Continent.

There begins to appear a faint glimmering of hope that the Gordon-Bennett race will be held in the United Kingdom after all. Should the venue ultimately be found in France or Belgium, it will not be the fault of the A. C. G. B. & I. With characteristic

energy the club has thrown itself, hat, body and boots, into the struggle to obtain an act permitting the race to be run in Ireland, and it is securing a rapidly accumulating volume of support which the advocates of use-and-won't, the only adducible objection, will find it somewhat difficult to resist. Letters showing the purpose of the race and benefits to be derived from it, not only by the automobile industry, but by the district in which it is held, have been sent to every individual and institution likely to furnish influence, and the response from Ireland and Irishmen has been a joyful chorus of welcome.

It is doubtful whether there is a country in the world where such an event would be more heartily received. Irishmen, high or lowly, rich or poor, enjoy a sporting event, and it will be some dis-



THE AUTOMOBILE AND THE ABORIGINE—A LOCOMOBILE IN QUEENSLAND

appointment to people in the district if the necessary consent is not obtained. The County Councils of Kildare and Queens County, in which the greater part of the course lies, will petition in its favor, if necessary; all the members of Parliament who have replied are wholly favorable; the clergy, led by the Catholic Bishop of the diocese, have blessed it; the press, the magistracy, peers and landowners, all in one glad acclaim, shout Welcome! Never was such unanimity seen on any question in Ireland before.

The original proposal was to start the race at three o'clock in the morning, so that it should interfere as little as possible with the work-a-day world, but this idea is scouted by Irishmen as absurd. They want it to start at such an hour as to permit people from a distance reaching the course to see the first round, and it is no ex-

aggeration to say that in sparsely populated Ireland, the race would probably be seen by more people than if run in densely populated France. If it comes off in Ireland the day is certain to be observed as a general holiday, and people will flock from all parts of the country to see it.

The course as proposed by the A. C. G. B. & I. is from Naas southwest to Maryborough, Maryborough in a ziz-zag easterly direction via Stradbally and Ballylynan to Athy, from Athy northeast to near Kilcullen, then turn sharp to the right until facing south and a little west to Carlow, passing through Timolin and Castledermot on the way. From Carlow a straight run somewhat west of north to Athy again, and over the same road as before to Kilcullen, then on to the starting point at Naas. This is the course favored by the club as giving the most straight running, but alternative courses over nearly the same ground are suggested, of which one would comply with the letter of the Gordon-Bennett rule requiring a distance of 150 kiloms. between the beginning and end of the course. The route given is 116½ miles, or about 188 kiloms. long, but of course the part between Athy and Kilcullen is traversed twice. If this course becomes the scene of the contest, the cars will require to cover it three times.

Shows are on tap in this country at present, and an ordinary man may be forgiven if he finds it a little difficult to keep abreast of them all. That held in the Crystal Palace was, however, too big an affair to miss attention. It is not necessary to recapitulate the many troubles and their causes which have afflicted the automobile industry on the show question in this country. It is sufficient to say that three shows, patronized by many of the manufacturers, will have been held in London ere the winter is over. One, a speculative adventure, by a cycling club, finished on January 24, less than a week before the opening of the second at the Crystal Palace on the 30th of the same month, while a third will open on March 21. The first of these was mediocre as a show, a failure from an attendance point of view, and a questionable investment as an advertisement to makers. It is to be hoped that it is the last of its kind, for the struggling industry has enough burdens in this country without having to support a multiplicity of shows, whether promoted by speculative outsiders or those connected with the industry.

The second, opened on January 30, was, without doubt, the

biggest held in Britain, and in some respects it was superior to the Paris salon of last December. It will be remembered that the latter was almost exclusively French, whereas the Crystal Palace show was a good deal cosmopolitan in character. Most of the French leading makers, such as Panhard et Levassor, Mors, De Dion, Renault, Darracq, Charron, Girardot and Voigt, Clement, Peugeot and many others, had elaborately fitted and filled stands; Germany and Belgium were both well represented, and America sent a fairly representative collection, including Wintons, Locomobiles, Grouts, Duryeas, Ramblers, Whites, Stanleys and others. Indeed, considering the number of American cars shown, one finds a difficulty in understanding exactly what was meant by the American National Association of Manufacturers when it decided not to show in Britain this season.

The Crystal Palace, where the show was held, is the most suitable building for the purpose in Britain. It is 1,608 feet long, 390 wide across the transept and 175 feet high. As the name implies, the building is of glass, and the light in clear weather is always good. The grounds are nearly 200 acres in extent, with splendid roads for trial trips by intending purchasers. It has been estimated that there were more than $3\frac{1}{2}$ miles of cars within the building, belonging to over 200 exhibitors, mostly British; but it may be added that numbers alone did not form the attraction of the show. Variety of type, size and price, from the £40 motor bicycle to the £2,000 Mercedes, was also present to a large extent.

There were few novelties in construction other than those referred to in connection with the Paris show, but a number of cars with a history, such as the Baker Torpedo, the Gordon-Bennett Cup Napier, the $3\frac{1}{2}$ H. P. Panhard which won the first Paris-Bordeaux race in 1895, with 10 miles an hour, and others were on view.

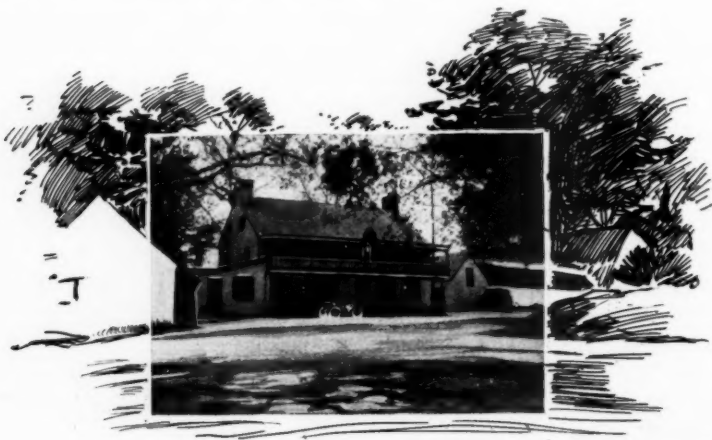
The attendance of visitors was highly satisfactory, and the sales are also said to have been extremely good. This show serves to demonstrate that the British industry is making satisfactory progress. It was a distinct advance on the Agricultural Hall show last April, apart from mere size, and if the makers can only keep their heads level, bearing in mind that with autos as with ladies' finery, if they are to be sold they must be in fashionable style, they will soon have charge of the home market.

Matters automobilic on the Continent are not in an intensely interesting state at the time of writing. The shows are in prog-

ress, but they are all of minor importance, and racing and other competitions have not yet begun properly. It is true that trials of auxiliaries have been going on, timing apparatus, silencers, etc., by the A. C. de F., and consumption by *L'Auto*, and that Marseilles enjoys the prospect of a racing week beginning on March 7, while a *criterium des Transports Automobiles* will be held on March 19, under the auspices of *La France Automobile*, followed on the 21st by the start of the delivery van trials from Paris to Monte Carlo, a distance of 680 miles; but the actual interest of the season begins with the Nice week on March 29.

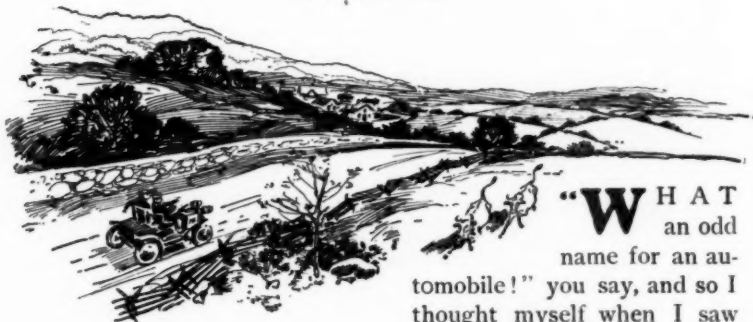
Meanwhile preparations are being actively prosecuted for the running of the Paris-Madrid race, which will begin on Sunday, May 24, and will occupy three days. This race is going to be a big affair, both in respect of distance and numbers. The Cannstatt firm have entered half a dozen Mercedes cars; Panhards, twelve; Mors, five; Ader, eight; Gobron-Brillié, three, and altogether within the first few days eight firms had entered thirty-eight cars. The race is being started on Sunday to give the French country people an opportunity of seeing it, the greater part of the French ground being covered on the starting day.

Automobilists should attempt a Sunday race in Scotland!! Shade of Knox! racing motor cars on a Sunday! The whole enterprise is foredoomed to a certainty, and if a single man reaches Madrid alive, every pious Presbyterian in Scotland will have inward doubts regarding the justice of Providence.



The Tour of the Lammergeier

By Ned Willson



“WHAT an odd name for an automobile!” you say, and so I thought myself when I saw it painted across the dash

just above the hood, but now, while I ponder over that eventful journey and think of all the strange incidents encountered therein I am not so sure but that the name was a well chosen one and well fitted to the strange freak of mechanism to which it was applied.

I first met Archie Burton at college, where our friendship started in a peculiar way. Each of us is long of limb and stand considerably over six feet in our stockings. Naturally we took to that peculiar contest in athletics known as the “high kick.” The first time we competed against each other I beat Burton easily and carried off a very handsome trophy cup much to his chagrin. In fact, Burton’s discomfiture was so great that he would not be more than ordinarily civil to me for the rest of the college year. During the summer vacation he must have practiced most faithfully, for at the next winter meet, although I surpassed my former record, he won the kick by a margin of over two inches, making a record of a little over nine feet. Burton was so elated by his record breaking that he was ready to make friends with anybody, and with me in particular. Ever after that I was his confidant in many of his schemes and inventions.

A student of electrical engineering, Burton managed by hard work to include in his studies such branches as belonged to the mechanical course alone. Not only this, but in the summer vacation, instead of going to the seashore or the mountains, as most of us did, he labored hard at home, spending all of his time in a small machine shop of his own, where he worked out many excellent contrivances. The result of it all was Burton secured some

valuable patents which were turning him in a competency by the time he graduated. Burton was by no means a crank; he was a thoroughly skilled engineer. He had learned the machinist trade before entering college and was therefore able to practically develop many inventions in private and to keep them an absolute secret until the patents upon them had been granted. He had worked so hard and so continuously preparing for graduation that I begged him as a friend to let inventions go for the final summer and take a trip with me, but he declined.

On the 24th of June I sailed on the Friesland for Antwerp intending to spend a year in Germany and England with practical engineers before taking up seriously the business of earning my bread and butter. While walking up and down the deck, vigorously fighting the effects of a ground swell off Sandy Hook, I stumbled onto Archie Burton. "Hello, Burton!" I cried; "how did this happen? I thought you wern't going abroad."

"Neither was I," he replied. "Fact is, I changed my mind only yesterday."

"Thunderation, man, how did you get passage? Why, I got the last berth on this steamer way last March. How in the Dickens did you find a berth, anyway?"

Sheepishly, and like a boy who had been caught eating an apple in school, he whispered "Steerage."

I saw him quite a number of times afterwards before we landed at Antwerp and tried to get him to discuss the plans of his European trip, but while he had often discussed his plans with me in the past in this instance he was as dumb as an oyster. Again, the following spring when outward bound on the Paris, from Southampton, I found Burton on board admiring the Needles off the Isle of Wight and still as reticent as ever. In fact, I was unable to get anything out of him but a promise to tell me all about it some time. It was second cabin this trip, he had seen enough of steerage.

We parted in New York just after our struggle with the customs officials, and that was the last I saw of him for over a year. Twice when passing through the village where he lived I sent in my card only to receive the curt reply that he was seeing no one. This attitude was so unusual, particularly toward me, that I knew Burton must have something extraordinary on hand to have thus changed him. While formerly he had done practically all his work himself, I learned that he now employed five mechanics, and



therefore I was positive he must have under way a machine of some magnitude.

Rumors were rife in Pannington, the small town near Burton's country place, that a strange monster had been seen dashing along the pike in the small hours of the morning. No one, however, could give me an adequate description of the contrivance,

but from what I could learn I presumed that Archie had under way something radically new in the automobile line. Nevertheless an account of it I had received from a countryman living about three miles from town both amused and puzzled me.

This man, Jack Patchen by name, was on his way after the doctor about two o'clock in the morning, when the blare of an auto horn and the flash of two big acetylene lamps had made him quickly pull his horse to the side of the road just as an enormous machine dashed by. The road at this point for over a mile in either direction was as straight as a taut string. What is more, in the direction the machine was going there was not a deviation in the road for three-quarters of a mile. Patchen told me that the moon was at its brightest and all objects of any considerable size were plainly discernible. Patchen's horse quite naturally exhibited some trepidation as the machine flashed by, and though it took his owner but a moment to quiet him, when he glanced around for the machine which had caused the trouble the road was empty.

"I'm not a bit superstitious," Patchen assured me afterward, when telling me the story, "but I certainly felt a little queer. I will take my oath that it wasn't half a minute after the thing had passed before I had the horse quieted and looked around. The big vehicle couldn't have possibly got to the first crossing in that time, yet when I looked up the road there wasn't a thing in sight!"

"That's pretty swift moving," I suggested.

"I don't think he could have been going over thirty-five miles an hour."

"How did you judge his speed?"

"Well, I used to run an engine on the P. & Q. and I think I can tell the speed of anything like that within five miles an hour."

"Would you mind showing me the place where it happened?" I asked.

"Sure," was the reply. "I am going to drive out home in about an hour, and if you like you can go along. You could put your bicycle in the wagon and ride back."

I did as he suggested, and Patchen soon showed me the place where he had turned out to let the machine flash by him.

The road was a good specimen of an ordinary country pike flanked by a strip of grass on either side. The surface was whitish, the kind of road that would show a gleam in the moonlight and upon which any object would stand out with great distinctness. The spot pointed out by Patchen was close to a bunch of scrub

oak, but from where he had stood on the night in question the view was unobstructed for over a mile to the eastward, the direction taken by the machine.

I asked him to repeat as nearly as possible the performance of quieting his horse so as to find out approximately just how much time it would consume. I caught the time just as he turned to look up the road and the hand of my watch indicated twenty-five and a fraction seconds. Further than this I knew that Patchen had a reputation for truthfulness and sobriety and that he belonged to the better educated class of farmers. My curiosity was piqued to the utmost, and as I rode back to town after thanking the engineer for his trouble, I determined to lay the ghost myself.

My plan of campaign was the simplest imaginable and consisted in nothing more than lying in wait behind the bunch of scrub oak until I should have the good fortune to catch sight of the mysterious machine. I had still a week belonging to me before the end of my vacation would come, and with the knowledge that I could readily, if needs be, get my leave of absence extended, I began my campaign that very night. Telling no one of my plans I rode out to my improvised sentry box that evening, trusting to a good novel which I took along to keep me awake, to read which I arranged my bicycle lamp so that while it would allow me to read it cast no suspicious ray of light upon the road. As the September night was damp and chilly I had provided myself with an old ulster and wrapped in I was soon deeply absorbed in Haggard's "Heart of the World." I remember glancing at my watch at two o'clock and again at two fifteen, then I was awakened from a slight doze by what I suppose was the noise made by the exhaust from a gasoline engine. Confused, as a sleeper often is when suddenly awakened, it took me a few seconds to realize where I was, then remembering my midnight mission I dashed out from my hiding place to the middle of the road and glanced hastily to the east and then to the west. The sound of the engine was fading rapidly in the distance, seemingly to the east, but seeing nothing in the road except a cow about a quarter of a mile away, I flung myself flat on the ground to "look Indian." Even this old boyhood scheme was unfruitful since the ground gave forth no reverberations as might have been expected from a heavy vehicle running on the road. Possibly I might have waited for the return of the machine, but I was so disgusted with myself for having fallen

asleep that I jumped onto my wheel and went back to town and to bed.

After my first failure I determined in future to get as much sleep in the daytime as possible, and henceforth I laid abed in the morning until too late for breakfast, taking a nap again each afternoon. This, with the aid of libations of strong coffee for supper, produced the desired effect, but I had nearly a week of tiresome watching before the apparition again put in its appearance. This time I heard it coming about a mile down the road, and quickly fastening my cap over my bicycle lantern I stood with one foot on the pedal ready to mount and follow it. Though there was a moon the night was cloudy and the glare of the headlights blinded me so that all I could distinguish as the affair rushed by me was that the machine had a particularly sharp prow and an exceedingly long wheel base, one as nearly as I could judge of fully twelve feet. The great thing went by with a roar, the muffler wide open and going at a speed of certainly forty miles an hour. I was in the saddle of my bicycle the instant the thing had passed, and bending low over the handle bars I managed for a little while to keep fairly close to my mechanical pace-maker. Certainly the vaporizer of that monster must have been set badly, for the fumes of gasoline cut my eyes until I became nearly blind. Suddenly both my tires collapsed as if by mutual consent and I took a header into the grass by the side of the road.

When I recovered from my involuntary dismount I discovered that I had again drawn a blank since the machine was nowhere to be seen. Saying a few things uncomplimentary, both about my fool luck and this disappearing machine in particular, I rubbed my bruises for a moment and then examined my bicycle. The wheel was undamaged with the exception of the tires, both of which were absolutely flat. I soon found that each tire had a gash in it about half an inch wide which looked as though it had been cut with a sharp triangular blade of some kind. With a few more uncomplimentary remarks I started back to find my overcoat, going at a dog-trot as I was dressed in my running suit.

Just as I got into the road again I came across a shining object, and upon picking it up found that in it I had discovered the cause of my ruined tires. What I picked up was a small piece of steel shaped like a beechnut, which, when thrown on the ground, would always be certain to have one edge uppermost. Kicking around in the dust, I found nearly a dozen of these tire destroyers

each of which was similar to the ancient caltrop with the result that it was probably about the most villainous thing that could be devised to bring discomfort to a cyclist. The idea of employing such things was just like Burton. He had foreseen that he and his whirlwind might be followed by cyclists and he had gone prepared to discourage them. I could not help admiring him for his ingenuity, although I by no means relished the two miles I would have to walk before I reached my rooms.

Once in bed I lay wide awake the balance of the night devising plan after plan by which I might accomplish what I had made up my mind to do. Just as day began to dawn I jumped from my bed with a "By Jove, I've got it!" Making a few hasty notes on a slip of paper I was soon back in bed and dreaming of automobiles with dragoons' heads, roads filled with steel beechnuts, exploding tires and an atmosphere filled with gasoline. I breakfasted hurriedly at 10 o'clock, and as the first move in my new plan took the 11 o'clock train for New York.

When a Seller You'd Be

YOU never know how ridiculously cheap good automobiles are until you have one you want to sell. Let it be supposed, for the sake of illustration, that a friend has presented you with a desirable new carriage and that it is expedient to turn the old one into cash.

The dealer in second-hand vehicles is really very polite, but he will convince you first of all that you are an avaricious sort of person, anyway, to be wanting to sell an automobile at any price rather than to give it away, and he will then prove to you, by force of the most logical argument, that a man who expects to get more than \$100 for the best second-hand automobile in the world is the next thing to a gibbering idiot.

You listen with attention, of course, and are properly impressed by all he says. The only thing that may tend to shake your confidence in his ideas is a possible query as to the price of any one of forty rattle-ty-bang old bone breakers that he has leaning against the wall, and beside which your own trim little runabout is as a racehorse alongside a lot of spavined dromedaries.

The dealer will look you unblushingly in the face and tell you that the cheapest of them is worth \$300. And you wonder where the harmony of his statement comes in.

How to Measure Speed

By George E. Vareiman

WHENEVER the vigilant policeman wishes to demonstrate that he is such, he proceeds to arrest some one for breaking the ordinances governing the speed at which automobiles may proceed through the city streets. The more important socially, financially or otherwise, except politically, that the arrested automobilist is, the better pleased is the policeman, because greater will be the space his brave act will be given in the daily papers when they report the arrest.

When the victim and the vigilant appear in court there is invariably a very wide divergence of opinion between the arrested and the arrester as to the speed at which the former was traveling. Granting that each is honest the whole question revolves upon the system used by such in computing speed.

To aid both automobilist and policeman, I append herewith a table by which it is possible for anyone with a watch to come very close, indeed, to the speed of any object moving along the streets. The table has been for use in Manhattan and that part of the rest of the city where the blocks run twenty to the mile, and show the time that a vehicle is making when it passes a block at the rate given in the table:

One Block Seconds.	Miles an Hour.	One Block Seconds.	Miles an Hour.
22½	8.00	14	12.85
22	8.18	13½	13.33
21½	8.37	13	13.85
21	8.57	12½	14.40
20½	8.78	12	15.00
20	9.00	11½	15.65
19½	9.23	11	16.36
19	9.47	10½	17.14
18½	9.73	10	18.00
18	10.00	9½	18.95
17½	10.29	9	20.00
17	10.59	8½	21.18
16½	10.91	8	22.50
16	11.25	7½	24.00
15½	11.61	7	25.71
15	12.00	6½	27.69
14½	12.41	6	30.00

Motors for Heavy Hauling

By James Reynolds, M. E.

THAT the public's interest in the motor hauling of goods is increasing no one who is at all observant can fail to note, and as the Automobile Club of America has very properly declined to ignore this interest by abandoning a public test under service conditions of merchandise carrying vehicles, a retrospective view of the progress of events in the history of heavy traction on common roads by power is at this time instructive.

The advances made in the way of superceding the draft horse with the engine are slow, out of all proportions to the anticipations formed a few years ago when the British Parliament sanctioned the use of self-propelled vehicles on British highways under conditions accepted with exultation at the time in Great Britain, and reflected not less enthusiastically in this country. During all this period individuals, more or less over-sanguine, have been learning facts which have been brought home to them, sometimes very rudely, and seldom or never, I fear, pleasantly, with an important bearing on the present and future use of motor trucks.

The first of these was the discovery that enormously more power is required to work a truck properly than was anticipated. The old style of reasoning was that a real horse power was 22,000 foot-pounds per minute, and a load for a good horse was $1\frac{1}{2}$ tons, including the wagon. One indicated horse power being 33,000 feet per minute, or 50 per cent. more than a live horse power, one mechanical horse power ought to be enough to haul 30 cwt.

This was theory, but it was not found out until various trials and disappointments had done their work that a mechanical horse power is in practice equivalent to about one-fifth of a flesh-and-blood-and-nervous-energy horse power. To-day few persons of experience would provide less than ten indicated horse power to do the work really accomplished by two draft horses.

The second lesson learned was that everything had to be made much stronger, and therefore more heavy, than was at first deemed necessary. To all intents and purposes, the motor-wagon makers in England are repeating the experiences of the traction engine makers. The result of all this is a not unnatural demand for such changes in legislation as will permit much stronger and heavier vans to be used than are now permissible. If such legislation takes place, it seems to me that in England and elsewhere, too, eventually, we shall have traction engines running about the roads in disguise.

Indeed, Taylor, of Birkenhead, many years ago, made, if I am not mistaken, a very useful big steam truck, which differed but little in appearance from certain modern ones. The essential difference in principle between the modern motor truck and the traction engine is that the load is carried on the same wheels as the mechanism in the former, whereas the latter hauls its load in wagons behind it.

The reason why horses are more effective than machinery for hauling purposes, although a very interesting subject for thought, need not be discussed now. It is sufficient for all present purposes to know that a great deal of power is required to enable a heavy truck to do useful work. Nor is it necessary to discuss the way in which the power is to be produced, whether by steam or by some kind of internal explosive engine.

The prime fact with which engineers have to deal is that the success or failure of any design mainly depends on the nature of the road on which the vehicle is to be worked. The V slides of a planing machine are integral parts of the whole. The permanent way of a railroad and the rolling stock constitute together one complete machine. In just the same way the highway over which a motor vehicle has to travel must be regarded as an integral part of all and every combination of mechanical appliances by which transport is effected on the road. In one word, if we attempt to dis sever the road from the vehicle of transport, we shall fail to accomplish anything.

Two or three years ago the maker of a steam truck told me that he was surprised to find how little power was required to work his van. He had been running it on smoothly paved streets. A week or two later on he was very much more surprised to find that on fairly good macadam after rain he could do next to nothing with the same truck.

In preparing the designs for any vehicle, the quality of the roads must not for a moment be forgotten; and it will not do to estimate the character of the road by anything but the very worst portions of it. A length of a few yards of soft sandy bottom on an otherwise good road will certainly bring a heavy motor vehicle which may have been doing well to grief. Curiously enough, I have found this apparently obvious circumstance constantly overlooked.

This is not all, however. A road may be level, hard, and of little resistance to traction, and yet be very destructive to mechanism. This type of road is rough and "knobby"; it will shake a vehicle to pieces, and the mischief done by such roads augments in a most

painfully rapid ratio with the pace of the vehicle. Jarring and tremor are as effectual as direct violence in injuring mechanism. Scores of examples of this might be cited. One will suffice:

In a motor van a long horizontal rod was used to couple the steering gear to the leading wheels. The rod was broken solely by vibration. It was replaced by a much heavier and stronger bar. That was broken in much the same way, and finally guides had to



be fitted to steady the rod and prevent it shaking. The benefits to be derived from india-rubber tires cannot be over estimated. But, unfortunately, when it comes to business vehicles they are only to be obtained at an almost prohibitive price.

Very earnest and well-directed efforts have been made to establish services of motor vehicles on common roads, in the belief that such a service may be cheaper and more convenient than railway work. I cannot believe that this will be found possible, save under very peculiar circumstances.

Some years ago a firm of British coal mine owners fell out with a railway company and wished to establish a traction engine service which would haul 10,000 tons of coal per annum a distance of about four miles. It was pointed out to the firm that the first result would be to cut the road to pieces, and so bring the haulage work to an end. The scheme fell through, but the facts are instructive.

The point in all such enterprises to be carefully kept in mind is that it is proposed to make the road carry an unwonted traffic. Indeed, it is specially claimed by the motor-truck people that they will be able to utilize such highways, for example, as those between Liverpool and Manchester, in a way that they have never been utilized before. The essence of the scheme is that whereas such and such a road has borne a traffic of 1,000 tons a month, let us say, it will now bear a traffic of 1,000 tons a week.

Now, be it observed that this traffic has to be carried on wheels, no matter what the means of propulsion may be, and that at the best of times the wear and tear of the road must, other things being equal, be augmented four-fold under the new regime, so far as wheel damage is concerned. It is urged that the wheels of the van will not be as destructive as the feet of the horses.

This we may admit, but only for the sake of argument. The fact remains that the road will require much more repairing under a very heavy motor traffic than by comparison it would require under a light horse-drawn traffic. The cost of repairs will fall on the taxpayers, and they will very quickly make their voices heard to some purpose. But even with this aspect of the case we need not trouble ourselves.

A motor-van service begins with an excellent road. The road gets out of repair; so, as a consequence, will the vans. Every borough engineer knows that "cobbling" a road is a most expensive and unsatisfactory way of repairing it. So the road is allowed to get pretty bad. Then it is all picked up and remade.

But such a road does not recover its surface for some time, greatly to the disadvantage of the motor vans. In other words, if the authorities do not keep the road in repair, the motor vans cannot be worked at all; and if they do keep it in repair, the very process of repair will be found prejudicial.

So far as past experience goes, both here in England and on the Continent, recent and comparatively ancient, it appears that under certain conditions the motor van may be worked with advantage and

considerable economy, but I have no evidence to show that these vehicles can ever compete successfully with railways. On the contrary, their function seems to lie rather in feeding them than in fighting with them.

Up to the present moment the data available concerning the cost of working such vans is too meager to permit any trustworthy general conclusions to be drawn. Ultimately, no doubt, the best possible type of motor van will be evolved, just as by the survival of the fittest what is apparently the best form of bicycle has been evolved.

But you have only to talk to the makers of motor vans, and ask each what he thinks of the vans of other makers, to realize how imperfect such machines still are, and how much it is admitted by those who ought to be most competent to pronounce an opinion remains to be done.

An Ingenious Indicator

THE advisability of taking indicator diagrams of explosive motors has long been recognized, but it remained for French ingenuity in this as in other important directions to take the lead, and to offer the world an apparatus which would do this both accurately and quickly.

The new French invention consists of a small cylinder, which is put into communication with the cylinder of the motor, the diagram of which is required. The piston of the indicator is attached to a rod which actuates a lever provided at its extremity with a pencil. Immediately in front of the pencil is a drum carrying a sheet of paper; this drum rotates uniformly with the motion of the crank.

It therefore follows that the piston of the indicator varies its position according to the pressure in the cylinder, while the paper follows the movement of the piston on a small scale.

From a diagram thus taken, the degree of compression, pressure at explosion point, pressure at commencement of exhaust, back pressure throughout the exhaust stroke, degree of vacuum on the charging on the stroke and firing point can all be determined. It is then evident that it is of capital importance to be able to take a diagram, more especially in the case of new models. These diagrams can easily be taken with the engine running at 500 revolutions per minute, but after that it is almost impossible.

In the Hospitalier and Carpentier indicator the cylinder and

piston is replaced by a membrane, the movement of which is very slight. To this membrane is fixed a mirror. A ray of light is projected on to the mirror, and its reflection follows the movement of the mirror. At the same time the mirror is moved horizontally by a rod connected with the crank shaft. The resultant movement of the reflected ray then corresponds to that of the line traced by the pencil in the old system.

Projected on to a sheet of ground glass, the diagram shows an almost continuous line, and can, if necessary, be photographed. The principle is not quite new, but it is the first time a practical apparatus has been constructed on these lines.

Outlook for Edison's Storage Battery

The announcement is made that this battery has now been finally developed and in a very short time will be sold commercially. Considerable difficulty has been found in getting sheet steel of the requisite thinness for the pockets, the diameter of this steel being only one-three thousandth of an inch. The output of the battery—that is, the amount of electrical force which it can turn into useful work—is about $11\frac{3}{4}$ watts per pound of cell. In all other respects the battery is said to have fully come up to Mr. Edison's original expectations.

Much trouble was experienced in perfecting the mechanical details of the battery, the caustic electrolyte coming through the air holes and short-circuiting the terminals outside. This had to be remedied by an ingenious valve. On rough roads plates came in contact through jolting, thus causing local short circuits. This had to be remedied by strengthening the plates which hold the small cells thereby decreasing the output of the battery from 12 watts per pound to $11\frac{3}{4}$.

The first public installation of the battery will be the equipping with it of a number of dry goods vans throughout New York city. It is intended that each of the big department stores shall have one battery outfit for its present automobile service, then the conduct of these batteries will be carefully watched and the future of the experiment determined.



What the Shows Have Shown

By S. Wallis Merrihew *

THERE was more need of shows than ever this winter. Without them the extent of the industry that has grown up almost in a night would not have been clearly perceived; nor would the public have been able to see whither trends were tending, nor what and why certain types had developed popularity at the expense of others apparently equally meritorious.

To the accomplishment of these purposes, therefore, the various exhibitions held within the past few months may be said to have been dedicated, even if such was not the object of their existence. The four shows of paramount importance were, to take them in their chronological order, as follows: The Paris Show, held at the Palais Royal; the New York Show, at the Madison Square Garden; the London function, with the Crystal Palace as its venue, and the one just closed at the Coliseum, Chicago. These stood for the three great automobile producing countries—France, England and the United States, and represented them in a thoroughly fitting manner.

First, in all essential respects, was the Paris exhibition. Its premiership will not even be questioned. In size, in the number of exhibits and exhibitors, in impressiveness and even magnificence, in the conception and execution of the vehicles shown, in the eclat of its opening and the sustained character of the interest aroused among the desirable classes, it was *facile princeps*. The fifth of a series of highly successful shows, each apparently touching heights that had formerly seemed unattainable, overpraise of the Paris Show seems impossible. Surely the future can hold no greater triumphs, one is forced to exclaim, knowing all the while that the word impossible has no place where the automobile is concerned.

If the premiership of the French show be readily conceded, the allotment of second place is not so easy.

In both the number of cars and of exhibitors the London exhibition outranks the one held at Madison Square Garden. Some 534 cars and 115 exhibiting makers went to make the tally—a most creditable showing, even by comparison with the estimated 1,000 cars and 200 firms of its Paris rival. Beside this the 250 cars and 100 exhibitors of the New York Show pall perceptibly.

Yet it should be borne in mind that the foreign exhibits at the London Show—principally of French and American origin—formed

a very considerable portion of the whole. Without them the show would have been shorn of much of its importance as well as luster. And this without overlooking the fact that the native makers had shown remarkable progress, or minimizing the importance and solidity of the industry.

The showing of the American makers, both at New York and Chicago, but more particularly at the former place, was really wonderful. It justified the comment of that well-qualified judge, Henry Fournier, who, immediately upon his return to Paris, and in response to the question put him, said:

"The first New York Show was nothing; the second one was not much; the one from which I have just returned, was very much, indeed."

That the automobile industry has been shod with seven league boots during the past year and a quarter, and has made the best possible use of them, is abundantly proved by a brief recapitulation of the salient feature of the preceding shows at Madison Square Garden. These were two in number—the shows of 1900 and of 1901, each being held in November.

The first was a venture—a daring one, requiring no small degree of courage in its prime movers, the Automobile Club of America and the Garden management. The industry was in its infancy, and automobiling in the East, at least, was largely a pastime of the wealthy classes. Whether a show could be made a success was a mooted question; but it was at least worth trying.

In a garden laid out on generous lines, with ample aisles and a lordly disregard of space, and with a demonstrating track encircling the vehicle exhibits, the first automobile show in this country was held. Some 28 vehicle makers, 15 of them showing gasoline cars, 9 steam and 5 electric, graced it with their presence, together with a fair sprinkling of parts and sundry people.

Crowds of the curious minded, attracted by the seemingly transient vogue of this newest "fad" of the rich, flocked to see it, and found ample repayment in watching the track performances. All day long, and until the lights went out at well toward midnight, an unending stream of automobiles sped around the wooden, egg-shaped slightly banked track, each vehicle filled with people, many of whom had not the remotest intention of ever indulging in more extended rides. Twice a day, too, "contests" took place on this same track. There were obstacle races around barrels and boxes, slow races, backward races, all designed to show the facility with which

the motor vehicle could be manipulated and controlled. The air reeked with the smell of gasoline. The public gazed for the first—and last—time at the sight, and departed, leaving behind the feeling that, in spite of the froth and fuss of strutting lay figures and the crudities and shortcomings of the exhibition, the show had demonstrated its right to live.

Thenceforth there was no doubt entertained regarding another show the following year. It was merely a question of how and when. As before, the Automobile Club of America acted as sponsor, and the Garden people undertook the management. The influx of new concerns disposed of the track project at the outset. In addition to the entire floor and the gallery, part of the basement and of the restaurant had to be made use of for exhibition purposes. The exhibitors included 36 makers, of which 22 were gasoline, 12 steam and 4 electric.

In spite of the increased success of this show it was felt that November was entirely too early a date for it. Consequently, it was advanced to January, with the result that 1902 was skipped altogether, no show being held that year in New York.

The gigantic nature of the success of the show in January last is too well known to render necessary more than the briefest mention of its distinguishing features. In extent as well as in variety of exhibits it completely eclipsed its predecessors. It overflowed all bounds. Three times was the arrangement of spaces made, and the last one proved insufficient to accommodate all who desired to show. The entire main floor was occupied, the aisle space being cut down to the danger point. The entire restaurant, the gallery, including the end boxes, the basement—all were requisitioned; and with only tolerable results in the way of accommodating those who wished space.

If the extent of the show was of this extraordinary nature, the character of the exhibits was even more impressive. They revealed with lifelike fidelity the strides that had been made in but little more than a year. The show marked an epoch. Of that there can be no doubt. It made it plain that the experimental stage had passed, that the industry had successfully coped with the many problems that confronted it. And, above all, it afforded convincing proof that it was at last able to offer the public every conceivable type of car, from the \$500 buckboard to the \$7,500 tonneau-bodied touring car. The gaps heretofore existing had been closed, and home factories were now producing everything that could be procured abroad.

In one respect the American market is unique. It neglects no

one of the three powers now employed in propelling automobiles. Gasolene, steam and electricity—all are adequately represented. Each branch flourishes and is represented by vehicles that have come to be recognized as the fittest of their respective types.

Of no other country is this true. France is almost wholly given over to the explosive motor type. It has been developed to a remarkable degree, and, naturally, to the neglect of the steam and the electric vehicle. Until within a comparatively recent date the former was suffered to languish in the background. Only the Serpollet firm believed in it, and only recently has it pushed the steam type with vigor. Even now, despite the success that has attended the Serpollet, especially in speed and hill climbing contests, it is left to fight the steam battle practically alone.

In England the steam car owes much of its prominence to the early introduction and vigorous pushing of the American-built vehicle. The Briton's well-known predilection for steam has led to a much greater use of that type than is observable in France or any other European country; and to the development of a large business among native firms as well.

But in neither England or France has the electric vehicle come in for the vogue that is its due. In the former country it suffers from almost complete neglect; in the latter it is quite overshadowed by the gasolene car. Its merits are unacknowledged, its possibilities overlooked. Time does not seem to change this verdict; a verdict delivered when the storage battery was much more imperfect than now. It seems to be regarded as inimitable, despite the mutability of the conditions that govern the manufacture of electric vehicles.

Here, widely different conditions prevail. Each of the three powers is regarded as a living, breathing force, capable of undergoing great growth, or even of proving the winning power. There are to be found plenty of people who will declare that one of the three agencies they favor will ultimately supersede all others. Consequently, each is an active force, striving for perfection and a place at the top.

At the previous shows the makers of steam and electric vehicles had no need to blush by comparison with transatlantic rivals. Their handiwork was, if not superior, at least equal to that in use anywhere. There was no development of the art seen anywhere that could be asserted to excel that prevailing here. No difference existed between the picked product of this and any other country. All makers worked along practically the same lines and supplied their customers.

with goods differing only in details. Where any difference existed it was in favor of the American article. Its steam cars were celebrated in many European countries, and competed there on more than equal terms with the home product. The same statement applied to electrics. In short, American steam and electric makers had nothing to learn abroad, but something to teach; and they were doing this by sending abroad yearly many thousands of dollars' worth of goods.

Of quite another complexion was the gasoline situation. The American runabout was world famous; and justly so. For price and reliability it "licked creation," as Europeans would accuse the Americans of saying. Its popularity was all the more noticeable in view of the decline of the *voiturette* in Europe; a decline that set in more than a year ago and followed a vogue, ephemeral, it is true, but none the less violent while it lasted.

But the runabout was not all there was in gasoline automobiles. There was the foreign racing type and its many more or less minute graduations; a type that had been growing steadily in favor for years, and that every year became more speedy, powerful, costly and complicated. Owing to the success of the first cars of this type it, and, consequently, its design, became recognized as the "proper thing," and thenceforth no deviation from it was even thought of by European makers.

This design embraced, of course, as regards the motor, the vertical cylinder engine, usually multiple cylinder as well, placed in front under a hood or bonnet. The car itself was long, low and of massive construction, and with a *tonneau* or limousine top. The preferred transmission was by friction clutch and shaft, with sliding gears and individual chains to the rear wheels; or it might be by a bevel gear shaft to a live rear axle.

This was the only possible design for an up-to-date gasoline car, as seen by a French autoist. One of the latter, upon revisiting this country a little over a year ago, remarked contemptuously that American cars were five years behind the French ones. The opinion was shared by all Frenchmen and many Americans.

At the second Madison Square Garden Show only one or two American cars were of this foreign type. The remainder were of the "American type," having single or double cylinder horizontal motors positioned rearwardly, and being strongly reminiscent of the shaftless carriage, as it was called. The few exceptions and the

French cars exhibited presented a marked contrast to these and were unceasingly examined and admired.

There was excellent reason for believing that only a moderate trend in this direction would be evidenced at the show of last January. Consequently, when its doors were opened and it was seen that there was a veritable exodus to the European types, there was a sensation. Stand after stand was seen to have in the place of honor a mastodonic car, the replica in essential features of the Mercedes, the Mors, the Panhard or other famous European cars. Clever designing and sound construction went hand in hand in them. All the features that have made the cars named marvels of even this modern world were there; and with them, others that went farther in the same direction, features that conduced to reliability, accessibility or efficiency.

In short, for once American mechanical master minds had stooped to copy, and in copying had gone farther and improved, bringing to the subject that marvelous ingenuity that has astounded other and older civilizations, and caused them to both admire and praise.

In the opinion of competent critics there were seen at the show under notice, cars that were superior to anything turned out of European workshops. Point for point the comparison is made, and when the balance is struck there is a credit to apportion to the American car that almost puts it in a class by itself.

The show demonstrated conclusively that the gauntlet thrown down has been picked up, the challenge accepted and the promise to excel, not merely to equal, made good. Speaking of the \$7,500 Packard car, the highest-priced native car there, the correspondent of a leading foreign automobile publication stated to the writer: "It is the finest car in the world. Nothing, either here or abroad, has yet appeared that will equal it. An intimate knowledge of the details of the best foreign cars leads me to this conclusion."

Unquestionably there were a number of cars that merited encomiums equally high. The Locomobile, the Columbia, the Toledo, the Peerless, the Searchmont, the Moyea—these are but a few of them.

But while sedulously cultivating the new type, the show made it plain that the old ones were not neglected. If the public wanted big, high-priced cars, they were there for the choosing. It could no longer be said that American factories could not turn them out, nor that autoists must go abroad for them. Equally certain was it, how-

ever, that the bulk of the demand was not looked for there. The runabout retained an unabated popularity and was accompanied by what may almost be termed a new development, and which merits attention at this point, viz.: the heavy runabout or the light touring car, as it is indifferently termed.

Cars of this type weigh in the neighborhood of 1,000 pounds and sell at a price approximating an equal number of dollars. They are almost invariably equipped with single cylinder horizontal motors, placed in the rear or center of the vehicle, and have planetary gearing and a central chain drive; they carry two passengers, although sometimes they have an emergency seat or are even fitted with a tonneau body. A link between the regulation runabout made famous by the Oldsmobile and the heavier car of the Haynes-Apperson type, this car unquestionably supplies a want, as its ready sale attests. The Cadillac, the Century and even the Rambler, are good examples of it.

The next step upward is the medium weight, medium priced car. It differs from the class just touched upon as to motor chiefly in having a double cylinder horizontal engine. With the runabout, to be described hereafter, it formed, until within a few months, the typical American gasoline car. In its somewhat changed form it is frequently fitted with a tonneau body, and so made to carry four or more passengers; although in its older form this was usually rendered possible by means of parallel seats.

In this type, too, was seen the most pronounced manifestation of the blind or "dummy" bonnet. In only one case—the finely designed and worked out Autocar—did this bonnet envelop the engine, it being in all other cases used as a receptacle for piping, supply tanks, etc. As a sop to the vertical-engine-in-front Cerebus, however, it found much favor. Conspicuous examples of it are found in the Winton, the F. B. Stearns and the Haynes-Apperson—cars in which ample power and strength is combined with moderate price.

Turning next to the remaining type of gasoline car, the runabout proper, it was found that it still held its own well, even if the heavy runabout, already referred to, is considered to be separate from it. Here the dominance of the single cylinder, horizontal engine is almost complete. What a year or two ago promised to become very popular—the runabout with a single cylinder upright motor of the De Dion high speed type—has distinctly lost ground. The Orient and the Crestmobile are almost the only examples of it, a fact due, in all probability, to the general decline of the high speed

engine, this decline being even more evident on touring cars than on runabouts.

In the light runabout class—which, it should be remembered, largely outnumbers all other types combined, the keynotes are simplicity and cheapness. These appeal with double force to their users. It is this vehicle that is marked out by manifest destiny to be the successor of the horse and buggy, the American national conveyance. As such it merits careful attention. At the 1903 shows it bore evidences of having been improved in detail while remaining unchanged in principle. A better vehicle is the result, one capable of greater service and efficiency than heretofore, satisfactory in the main as such cars have been.

No one could visit the shows this year without being impressed with the change that has come over vehicle bodies. Heretofore, surreys and tonneaus were the exceptions, two-passenger cars, with occasionally provision for pulling out an extra seat in the front or back, the rule.

The present season, however, promises to go down in history as the touring-car year. Opinions may differ as to engine position, the number of cylinders, the weight, size and price, or a dozen other matters, But for once the belief is practically unanimous that the demand is, or will be, for touring cars. And, for the present, at least, the overwhelming popular touring car body is the tonneau. Whether this is because of its greater seating and luggage capacity it is not altogether easy to say. But whatever the cause, the result is there. "Tonneau bodies," says fashion, and "tonneau bodies it is," respond the makers.

Of gasoline cars, therefore, there are now three distinct types, viz.: the light runabout, the light touring car and the heavy touring car; while the latter is also divisible into two types. Of these, one is the older or American model, equipped with one or two cylinder horizontal motor; the other is the European or Continental type, with multiple cylinder vertical motor.

These four types completely dominate the field. Along these lines the development of the gasoline end of the industry has taken place during the past fifteen months. From these four types the autoist is privileged to make his choice. It is a wider one than is offered to the European autoist, wider in that it embraces a vehicle practically unknown on the other side, if a few cars, like the new De Dion light model be excepted; reference is had, of course, to the light runabout. With the decline of the Vioturette, already com-

mented upon, the nearest approach to anything of the kind abroad has practically disappeared.

In consequence of the simultaneous appearance at Madison Square Garden of a number of the European type of heavy touring car, the light runabout and—to a slightly less extent, the light touring car—appeared to receive a slight set back. But it was more apparent than real. There was but a slight temporary obscuration of the orb, due to the sudden appearance of a rival orb. The light vehicles will certainly continue to be the most popular, the most widely used of all. For one heavy touring car built and sold there will be a score of light cars. The latter are of necessity the choice of the large majority of users, the plain people, who must form the mass of automobilists. Two reasons, each logical and irrefutable, make for this end. One is the inability of the average user to pay from \$2,500 to \$8,000 for a car, the other the present impossibility of turning such cars out in any but extremely limited numbers. No factory in the world is equipped to turn out much, if any, in excess of 1,000 of them in a single year. Probably not half a dozen produce as many as 500. One a day is a large number.

The shows made plain what was already more than suspected, that the day for sensational developments in automobile construction has passed. Save only the appearance of the big, high-priced touring cars, the models for 1903 differ only in detail from those of 1902. They are an improved vintage, of course. The non-stop runs and reliability contests of the past season afforded data upon which to work for general betterment. The weak points stood revealed, the desirable changes were indicated. As a result, structural changes have taken place, and in this case change and improvement are synonymous.

Taken as a whole, the new gasoline cars are stronger and more powerful than their predecessors. No halt has yet been called on the increase of weight, power and price that has been going on. From the runabout to the touring car it is found that the engines are more powerful. From ten to twenty-five per cent. the increase ranges, and in some cases this and other improvements are unaccompanied by any corresponding increase in price. With respect to the heavy touring cars, however, it is quite otherwise. Almost without exception the prices have been increased, the increase being accompanied by an all around betterment that offers a reasonable explanation of the advance.

In the motors themselves, there is a very decided trend to-

ward the multiple cylinder and the vertical types. Indeed, the multiple cylinder was in a decided majority; with the vertical cylinder it was different; all it could do was to come in a good second. Nevertheless, the increase has been so great that there is little rashness in prophesying that a year from now it will be in the lead.

As a rule, transmissions were seen to be in keeping with the type of car. If it was a runabout or light touring car, the planetary system, with a central chain drive to a live rear axle was almost universal. On the other hand, the heavy cars, or a majority of them, were given over to the friction clutch and sliding gears, either with individual chains to the rear wheels, or with a shaft and bevel gear to a live rear axle. The last method was seen to have gained materially in favor, the Peerless and a number of other high-priced and powered cars being marked by it. Such advanced Continental ideas as the direct drive on the high gear was also seen to have been adopted in a surprisingly large number of cases.

Control systems, especially on the larger cars, was seen to have been much simplified. Fewer levers were used, governors were in general use, and throttling on the intake valve was much favored.

Ignition devices had evidently received much attention. The troubles that had been so much complained of during 1902 had been attacked, and much had been done to minimize, if not to eliminate them. Greater care in wiring and in protecting the parts most liable to short-circuiting was noticeable.

In spite of this, the diversity of opinions regarding igniting methods was very noticeable. Both dry batteries and accumulators, or storage batteries, were used, the latter alone, the former solely or in conjunction with dynamos or magnetos. The last-mentioned devices seemed to have gained some ground, but not very much. In fact, there were instances of concerns abandoning them and turning again to dry batteries or accumulators.

Carbureters underwent little change. In fact, although there is little approach to standardization in them, each manufacturer turning out the type that experience has shown to be satisfactory, carbureters nowadays gives little trouble. They may be hand adjusted or automatic, but in either case their working is such as to leave little ground for complaint.

Wheel bases have not ceased to be lengthened, wooden wheels are in an overwhelming majority, steel or iron angle frames, sometimes in conjunction with wood, have almost pushed tubular frames

to the wall; reaches are almost non-existent. Wheel steering was found to be standard on nearly all cars except runabouts.

If attention be paid only to the shows, it would seem as if steam as a motive power for automobiles was in a bad way. Makers—or, perhaps, it would be more exact to say some makers—were much less confident of the future than they had been. Nearly half the number of steam makers exhibiting at Madison Square Garden had also turned their attention to gasoline, and had put out, or were preparing to do so, cars of that type. On the surface, it resembled a gasoline landslide.

This showing was both surprising and disappointing. Only three months before, the Reliability Contest to Boston and return had taken place. In it the steam car achieved a veritable triumph. Its showing was not only magnificent, but unexpected as well. No one looked for such a large number of clean scores, not even the steam makers themselves.

Two facts stood out prominently at the shows. They were, first, the "gasolening" of a very large proportion of steam makers, and the consequent featuring of the gasoline cars of these same concerns; the other was the confident manner in which several of the "steamers" took the aggressive and expressed their belief that steam was still the coming power.

Of steam cars shown there were just two types. The first was the vehicle made familiar by long use, and famous in this and European countries. The name most frequently given to it is that of runabout. Its most usual form is that of a two-passenger vehicle, with sometimes an extension seat, either in front or rear. In surreys, too, it is frequently met with, but never in tonneau form.

The other type exhibited was what, for want of a better term, may be called the gasoline model. In appearance it could scarcely be distinguished from the popular form of gasoline car. Long, low, massive, powerful, speedy, possessed of great radius, tonneau-bodied, it was a fitting companion to the big gasoline touring cars. Four different cars contained these features, viz.: the White, the Toledo, the Grout and the Meteor.

All of them were real "road locomotives." If it was the outward resemblance to French or German big cars that was wanted, here it was with steam as the propelling power. With it went the peculiar advantages of steam—its greater flexibility and more perfect control, the absence of vibration, etc.

As to the future popularity of the two types it is not easy to

say. The runabout or light car has undeniable advantages. It would never have retained its hold unchanged in design if this had not been the case. Even to-day it has hosts of admirers—users who declare that for all around service—particularly city work—it is superior to anything on wheels.

For the new type of steam car it may be said that it is sound constructurally as well as popular. The long wheel base conduces to easy riding, the low and massive construction to stability. The shape of the chassis permits of a most advantageous disposition of the working parts. The engine can be placed under the bonnet, although this is usually reserved for the supply tanks. Larger boilers and more powerful engines can be readily fitted, and with a marked improvement in efficiency.

As was the case a year ago, the White is the only American car employing a flash boiler or generator. The marked success of this car affords ample vindication of the departure from ordinary steam practice. On the other hand, such cars as the Prescott, the Toledo and the Locomobile can point to exemplary records during 1902, as proof of their merit.

Taking the steam cars as a whole, and excluding the big car development already touched upon, it was apparent that the changes were detailed ones, but scarcely the less important on that account. The early steam cars were underweighted and underpowered. It has taken years to correct this error. Not only the engines and boilers, but all pipes, connections, etc., have now been strengthened by increasing their weight. In consequence, there has been a marked improvement in efficiency, as was shown last fall in the Boston contest. Accessibility and convenience of parts, the adoption of power for hand driven pressure pumps, etc., are also features very noticeable at the show.

There was observable also a tendency to give the kerosene-burning car a more extended test than it has yet had. It may succeed. A better knowledge of the problem formerly found so difficult unquestionably exists, and the confidence shown indicates that its solution is near at hand.

If steam was momentarily, at least, under a cloud, judged by the shows, it was very different with the electrics. They revealed a steady and healthy growth. The old-established makers, which had previous shows to themselves, were joined by new ones, the Studebaker Company being the most notable.

It was not to be expected that any startling changes would be

revealed. The electric vehicle business is too old, comparatively speaking, and conducted too much along horse carriage lines, to warrant anything of the kind. Outside of the batteries and their method of carriage, detail improvements alone are to be looked for.

The electric runabout type of vehicle seems to be growing in favor. Naturally, therefore, it has come in for considerable attention at the hands of designers. A refinement of lines and a lightening of the vehicles has resulted, and a more extended use of this model for city use may confidently be looked for.

In both the light and heavy vehicles there is a trend toward a more extended use of ball bearings. The urgent need of conserving power is, of course, partly responsible for this, each maker feeling that the adoption of any anti-friction device is sound construction. There was also seen a commendable endeavor to add to the commodiousness and comfort of the luxuriously appointed coupés, handsons, broughams, etc.

The battery is truly the heart of the electric vehicle. The world waits for the storage battery that is to revolutionize the industry; but heretofore it has waited in vain. The 1903 shows proved no exception to the rule. A much touted battery of a much advertised inventor was again shown. But still it lacked the ability to go, and the claims made for it when it reaches the "go" stage have been much abated; so much that its claims are now so modest as to leave little to hope from it should it ever become a commercial success. In short, it promises then to become simply a competitor of the Exide and other well-known batteries now in actual use.

These batteries have been further improved in detail. A radius of action of between 40 and 50 miles on one battery charge is now guaranteed by nearly all makers. This, with the steady growth of charging stations, and of facilities for charging, makes the electric vehicle more and more sought after, and establishes its popularity on a firm basis.

It is very noticeable that the method of disposing the batteries in two separate compartments, one in front and one in the rear, which was new at the 1901 show, has gained ground. This plan distributes the weight to much better advantage, and is likely to come into even greater use.

For a considerable time the absence of covered or all weather cars—outside of electrics—has been noticed and deplored. This year, for the first time, the void has been filled, or partly filled. A most notable showing of closed and semi-closed cars was made—

limousines, canopy tops, physicians' coupés, etc., and the showing included both steam and gasoline cars, instead of, as formerly, electrics alone.

These vehicles are undoubtedly the forerunners of a general movement in this direction. The all-weather car—like the commercial vehicle—must come. Detachable tops for both good and bad weather, permanent tops for storms alone—these will undoubtedly find ready purchasers.

Heat in Bearings

THE efficiency of all machinery depends in a large degree upon the condition and lubrication of its bearings. If the bearing surfaces are defective the frictional resistance varies directly as the amount of work put upon the bearing. The following experiments, made on an axle bearing by an eminent scientist and recorded by "Uhland's Technische Rundschau," not only show important results, but at the same time they seem to disperse many erroneous ideas concerning superheated bearings:

Temperature of bearing in degrees C....	29	49	64	82
Friction in pounds	8.0	7.5	6.0	3.0

From this it will be seen that up to a certain limit the temperature varies inversely to the friction. At a temperature of 82 degrees frictional resistance began to increase; at 93 degrees frictional resistance was 6.5 pounds, while at 115 degrees it was 7 pounds. According to these figures the resistance offered to a bearing running at 115 degrees was one pound less than that offered to it when running at 29 degrees under similar conditions.

It is manifestly impossible to give any hard and fast rules respecting the proper temperature at which bearings should be run in order to secure their highest efficiency, but it is nevertheless a mistake to think that there is more frictional resistance offered to a bearing running warm than cold.

One of Our Pet Phrases

"Did any of the people run into by that automobile escape with his life?" inquired the man who wants harrowing details.

"I didn't stop to ascertain," answered the man who is harrowingly exact. "It seems to me though, that if anybody escaped without his life there wasn't much use in his escaping, anyhow."

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Are These Institutions Threatened?

WHETHER in a spirit of pleasantry or in real earnestness, we know not, but in any event a correspondent says: "The automobile may be a very fine thing, but real Americans ought to abjure it and fear it. Fear it? you say. Yes, because its popularity might seem to kill our four most precious American institutions—the horse race, the county fair, the bronco buster and the horse-swapping deacon."

We can imagine no worse threat which could possibly have been made against the automobile than this one. Banish the good old horse-swapping deacons—the David Harums that we love—what would life be without them, with their genial, whole-souled hearts as big as their overflowing granaries, their only faults their weakness for spoiling the Philistine? No, indeed, this must never be! Better a thousand times that automobiles should cease to be than that their vogue should make our Harum less!

Awful as this is to contemplate surely sadder still would be the passing of the horse race, and the worst of all the county fair. For there are no institutions fuller of the American spirit or brighter with American color. Everybody who has seen them will acknowledge that.

The varied crowds—Rubes and fakirs cheek by jowl, the crowded tents, the rich displays of all that is tempting of farm products, slick cattle, the grandstand full, color and life everywhere.

The other day in one of our upland counties we passed the deserted site of one—the fences, buildings, everything gone—all but one rotting flagstaff—and the great round of the race track now a mass of weeds and undergrowth. On that course dozens of times we have seen stirring harness races and crowds going wild, and now the track itself was a weedy wilderness, running wild through sheer neglect.

We do not believe that the automobile will ever be responsible for the passing either of the tribe of Harum or the county fair. Each of these institutions are too American, too close to the hearts and to the pockets of our people ever to be supplanted by a leather clad chauffeur, a motor show or an automobile race. All this being our opinion we feel that it is not yet incumbent upon us to abandon the automobile; in fact, we really believe that the day is not far distant when our David Harums will be motor traders and the supporters of county fairs will journey thence in vehicles bereft of horses.

An Important Matter of Business Policy

THE considerable increase in the number of automobiles, far from lessening the value of a name readily recognized by the public, or obscuring an individual line of work brought to a successful issue, only serves to add to the one and confirm the importance of the other. In fact, the better known and the proven makes stand out all the more distinct on their separate merits, while the rest are hardly distinguishable, one from the other, in the public mind. This is well exemplified at the current shows, where familiar names, both of men and machines, attract attention as a matter of course, while it has required special novelties, usually something appealing to the eye as well as to the understanding, to win the same amount of popular attention for the others.

In a business sense, at least, there is something very substantial in a name. The manufacturer who is willing to invest a large amount of money in advertising, thereby vouches in the most practical manner for the continued high quality of his product. He is the last to reckon on the weakness of some people for the lowest possible price, or to count upon their forgetfulness of any trouble they have with his machines, to make everything all right in the end. On the contrary, people are coming to discover for themselves just what is behind the name, and their judgment, collectively, if not always individually, is final.

The right sort of reputation never stood for as much as it does to-day; it has become an index of worth as well as a badge of honor. Nothing else has so much to do with establishing the place of any line of automobiles, or in defining their relative value to the industry. A name-plate, if it does not directly remind one of these things, at least conveys an impression which often influences the purchaser of a vehicle one way or the other. Concerns have sometimes lost some standing with regular customers when their machines became too conspicuous in the bargain sales' columns of the trade press. In a case of this kind, intuition asks the reason why, and with no answer forthcoming, makes up its mind in its own way—sometimes without knowing or caring why.

"Special" and "personal" concessions in the prices of automobiles advertised as best value for the money have a tendency to undermine the confidence of close reasoners among buyers. Once surrender anything on this point, and the public will expect more and more, without ever being satisfied. But concerns which guard the reputation of their product most zealously—progressive design, good construction and uniform price, all considered—find it comparatively easy to dispose of all the vehicles they can make, and that on their own terms. They prosper by the double advantage of larger sales and higher average returns on each transaction. Such a defence of one's good name is well worth while.

Roads and Their Builders

NO one knows the total mileage of our common roads, but their length in New York State is estimated at 123,000 miles. The more important highways of Massachusetts have a mileage of 20,500 miles.

All students of highway improvement agree that the condition of most of the common roads in America is about that of the English roads, early in this century, when they were so bad and toll rates so high that the question of improvement was forced upon the British public.

England had no railroads then, and if it had not been for the wonderful development of our railroads the question of highway improvement would have come to the front long ago in this country.

The people, however, are more and more impressed every year with the fact that road improvement is necessary to reduce the cost of hauling, to make roads fit for pleasure driving, and to save the enormous waste of labor now expended on bad roads.

When we fully understand that there is no economical way to obtain good roads except by building the best, our practical education will have made a long step.

This lesson has not yet been learned thoroughly. Many of our so-called good roads are not the best, and, therefore, are not economical. The men who built them would have done better work and spent no more money if they had profited by the experience of England and France. It is not yet too late to prevent further errors of this kind through a continuation of the mistaken idea that we in this country have nothing to learn from any other. When roads are the subject there is hardly any country which can not teach us how to build and how to maintain them.

New Routes Planned for 1903

THE sport of automobiling, like its hardy big brother, the manufacturing industry, has its tendencies and its evolutions. First of all, there must be the quickened seed in good ground; then a period of working upward toward the surface and the sun; and afterward forms and directions of its own. The motor vehicle and its allied interests in the United States have already passed the first stage, and are now coming rapidly out of the second period of growth into the third. It is a sheer multiplication of the former opportunities, with a new range for effort and enterprise. Permanent lines begin to show themselves on the outdoor end as in the design and construction of machines.

For one thing, there is a relatively larger part and place for touring in the automobilism of the future. If substantial evidences

were needed, nothing could be more convincing than the marked increase in the number of "touring cars" listed as such in the 1903 catalogues. Special equipments for the road are also offered in greater variety, until one may order his or her outfit for a trip of a week or month, and be assured—as never before—of something serviceable and in good taste. This is not blind faith on the part of the manufacturers of automobile fittings, the tailors and modestes; but rather a result of the careful reading of the tendencies of the times by these very practical-minded people. The country around home—mainly city and suburban—has been growing too small as the range and reliability of the automobile has been extended, until now one's program is principally a matter of inclination and passable roads.

The separate tours, published in *THE AUTOMOBILE MAGAZINE* during 1902, were six in number, and taken together they were meant to cover the routes most likely to be called for by the largest number of touring automobilists during the first season. Experience in the shape of subsequent correspondence with subscribers, proved this to be the case, since a large proportion of the inquiries received in 1902 were answered by the work of that year, notwithstanding the fact that a comparatively small portion of the country could be brought so soon into our system. The following list will show the printed results up to this time, the copies of the magazine named being still available at the regular price of 25 cents each:

New York-Albany.....	May
New York-New Haven.....	June
New Haven-Springfield-Boston.....	July
Boston-Providence-New Haven.....	August
Chicago-Milwaukee	September
New York-Philadelphia.....	October

It is the purpose of our touring department to begin its outdoor work a month earlier this year, and to publish the first route (1) Philadelphia-Baltimore-Washington, if nothing prevents, in the April number. This sort of beginning seems called for in order to make a continuous line between Boston and Washington as soon as practicable, and completing at the same time the most important single line along the Atlantic coast. The route from (2) New York and Philadelphia to the Jersey coast resorts calls for separate treatment, and it is expected that its publication in the May number will be early enough to suit all requirements.

The intention is then to carry the work further west, by going over personally and making up route outlines from (3) Albany to Buffalo (joining with the New York-Albany line for a complete route from New York to Lake Erie); (4) Buffalo-Cleveland-Toledo; (5) Toledo-South Bend-Chicago; (6) Chicago-Indianapolis, and (7) Indianapolis to Cleveland. At the last-named point the New York-Chicago outward route will be entered. In the meantime such other trips as may be possible in the course of the work already outlined will be taken up. By this means the central and western sections of New York State, and (particularly) the middle West, will have a larger representation in the general plan.

This will also prepare the way naturally to take up a plan a year later, having St. Louis, Mo., as the chief objective point, with the exposition of 1904 to give it special timeliness. At this writing it appears likely that St. Louis will be approached from two directions, (a) by striking out from Chicago across the State of Illinois, and (b) by running a new line from Baltimore and Washington to Cumberland, Md., and Wheeling, W. Va., across Ohio to Indianapolis and Terre Haute, to the exposition city, following in great part the old Cumberland Road, built by the Federal Government in the early third of the last century, as far as Indianapolis, and later by State enterprise to the Mississippi River.

So two more years are called for, and apparently this sort of work grows in the doing of it. But more than ever before *THE AUTOMOBILE MAGAZINE* will give its subscribers the best touring information and reference service to be had anywhere in the United States; and that service will be, as in 1902, without extra charge of any kind.

As to the motor vehicle, considered from the health standpoint, there has until recently been little said. Sir Henry Thompson, however, has published a book on motors, in which he appears as an enthusiastic advocate of this form of exercise. He declares that the easy jolting which occurs when an automobile is driven at a fair speed over the highway conduces to a healthy agitation: it "acts on the liver" in much the same way as horseback exercise acts. He says the exhilaration which accompanies driving in a motor vehicle is particularly helpful to people who are somewhat enervated. Furthermore, the action of the air on the face, and the continual inspiration of fresh air, tend to promote sleep, and is an excellent aid in the prevention of insomnia.



THE last day of the Chicago Automobile Show was noteworthy because of the decidedly antagonistic spirit with which many of the exhibitors viewed this year's show and a prospective one next year at the same place. Several of the leading manufacturers held a secret meeting and some twenty of the largest users of exhibition space in the Chicago have declared that more western show was to be a show of they would confine New York Show one. One of the senting manufactur-business is in Michi-had not sold one ma-could not have sold the two thousand odd dollars it had cost him to come to Chicago. His space in the Coliseum alone cost him in the neighborhood of a thousand dollars which, in connection with the loss of time the show caused in his office and factory, he thought would make his total loss fifteen to twenty thousand dollars. Many of the exhibitors declared to me that the "game was not worth the candle," and said there would be a strong fight in the Manufacturers' Association if any attempt is again made to give another national show in the West. They say that the western show was a repetition of New York with exception of some western agents who would have come to New York had there been no show in Chicago, and who in any event could have been reached by travelers to better advantage.

These agents came in bunches and compared notes and the result was that they learned some things that caused more or less



Show are said to they would have no in theirs. If there a national character themselves to the and let that be the largest of these dis-ers, whose place of gan, told me that he chine which he without spending

worry to the manufacturer. It gave them a chance to compare discounts and individual treatment, and the expense of their coming was, in a measure, borne by the makers.

It seems to me that if there is to be only one show in the future of a national character, it should alternate between the East and the West, since, with all its faults, there is no place quite as good as Chicago, speaking from a geographical point of view. The Chicago papers did not treat the show in anything like the liberal way the New York papers did the Madison Square Show, and the reporter for the Chicago daily in the press gallery at any time during the show was as scarce as a clean spot in Chicago.

A national good roads convention was boomed and billed for the Windy City and it was largely wind. The promoters had not counted on the Chicago spirit when it comes to wanting good roads and clean roads, for Chicago has got into a



slough of despond which would have given John Bunyan's Pilgrim a worse heartache and tired feeling than he had in making his journey to the celestial city. The meeting came off Friday night in the great Auditorium. A band on an automobile truck paraded the streets during the day and a

large banner announced that seats would be free to hear the orators of national reputation who would talk about good and bad roads. Chicago must have felt guilty because less than two hundred and fifty people sprinkled themselves through the vast space where a kissing Hobson, Carrie Nation or a Hinkey Dink politician would fill the place. The expense of the meeting was about a thousand dollars, so the National Good Roads Association paid the two hundred and fifty people about fifty cents each to hear talks in their own behalf. It is said that only fifty of the two hundred and fifty were Chicago people. Some people blamed John Brisben Walker, who had charge of the affair, but I think the blame can be placed on the patient Chicago martyr who has been sandbagged so persistently by their city governors that the wicked place, if paved with anything else than good intentions, would be just good, attractive walking to them.

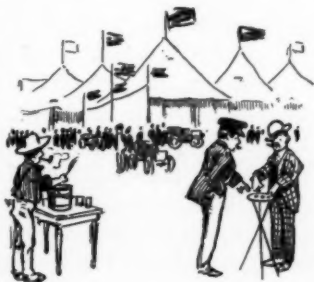
Of course, you can blame the Chicago climate if you like, but

it seems to me that if the managers of this good roads farce had held the meeting in the Coliseum during the show, say, during the afternoon, and made the admission free—if the managers of the show would have permitted—a much larger crowd would have been present and much expense could have been saved, which savings might have been invested in samples of improved pavement for Chicago, or cleaning the streets of a few feet of mud.

There is no doubt but what the whole show issue will either be dealt with vigorously or else it will die a natural death from too much blood-letting. I believe the show question will for a year or two settle down in one annual show of national scope and a lot of local shows conducted by the agents at no expense to the manufacturers. Small cities and large towns will have what they call an opening week, just as the milliners do at Easter. I want to advocate an idea which I think will meet with approbation when it comes to finally settling this question about shows. The idea is not my own; it originated with F. F. Weston, of the Prescott Automobile Company, of New York, though I have elaborated Mr. Weston's idea a bit:

The scheme is an annual national automobile festival or encampment to be held annually in the month of October, alternating between the East and the West. This is a modernization of the famous Harrogate encampment, which, in days gone by, was a sort of cycling convention for all England and the British Isles. For the American camp I would erect mammoth tents in one of which I would hold the good roads meetings. I would have an exhibition track so that manufacturers could demonstrate the capabilities of their vehicles to prospective purchasers. In one of the large tents could be held the various business meetings as well as the meetings of all automobile associations without disturbing a display therein, for the trade only, of all the parts and sundries of the business.

Another large tent could be utilized for an automobile exhibit proper, to which the public would be invited. During this encamp-



ment practical tests could be given of the various vehicles' efficiency, both in hill climbing and in road work of a kind such as the user of a vehicle would be likely to encounter. The camp should be pitched in a locality where good roads could be had. The feeding of the multitude could be let to a caterer which would be one of the various sources from which revenue could be obtained. The price for space in such a show would be nominal, and if a small tax was levied upon the gross amount of retail sales, the tax to go to the association to defray expenses, the financing of the scheme would be simple and perfect. All profits from space renting should be returned to exhibitors *pro rata* according to the amount paid by them for space. If such an encampment was located on the line of a railroad, that railroad should give the association a fair percentage of the sale of tickets to the encampment. All revenue from any other sources should also be in a part diverted to the automobile manufacturers' treasury. The name of the encampment might well be the National Annual Automobile Encampment. Now, what do you think of this scheme, Messrs. Manufacturers and Readers? Would it not be practical and a novelty which would secure much publicity and at the same time be a panacea for the show evil? Tell the writer what you think of the idea by writing him in time for him to make use of your comment in the next number.

AUTOMOBILE MAGAZINE readers will remember some comments in our February issue on the various banquets given in New York during the Madison Square Garden Automobile Show. Allusion was made to all of them and especial mention was made of the trade banquet given by the Hyatt Roller Bearing Company, of Harrison, N. J. The reason for this special mention were several in number. In the first place, the function was given by a manufacturing concern which was an innovation, particularly as it was given by a concern which makes about the smallest part of an automobile. This enterprise on the Hyatt concern's part was apparently appreciated by some thirty-five representatives of automobile manufacturing concerns whom the writer had been delegated to invite. It was my wish, expressed to the concern above, that members of the trade press be invited, but for reasons of their own they preferred to confine the banquet to the manufacturers. I think it is about the first function of the kind ever given by an automobile parts maker. From what was said during and after the banquet the affair pleased

the people who were invited to it and who became better acquainted with the gentlemen who gave it, which, after all, was the purpose of the affair.

It seems that the omission of the Hyatt Roller Bearing Company to invite the representatives of the trade papers was of such vital importance that at least one of them salved its outraged feelings by an editorial attack upon the company. It always pays to stand well with the press and to treat them frankly and squarely, for all editors are human, even those who pose as exponents of a peculiar brand of journalistic ethics, but this does not mean that a man may not give a dinner to whom he will, when he will and where he will, without as a result of selecting his guests be attacked by those he has omitted.

From a temperature of 75 degrees before breakfast in Florida to 10 degrees below zero in Chicago after dinner was the rude shock in the way of climatic conditions I have just undergone. Chicago always provides its very worst weather for automobile shows and for the past three events of this kind the climatic conditions in Chicago were such that New York, with its beautiful springlike weather, was sadly recalled by the show visitors and exhibitors who had the good fortune to have visited Madison Square Garden recently.

New York and Chicago are radically different, not only in their weather offerings, but also in the kind of people who patronize shows. New York provides the polished, well-dressed society man and woman; Chicago on the other hand, turns out the rough and ready business man along with such a small sprinkling of Stock Yards' society as to be hardly noticeable. This condition of affairs was brought forth strongly to those who saw the New York Show patronage and then witnessed what Chicago provided. Again, in the way of sales the contrast was plainly seen. New Yorkers bought expensive cars and plenty of them, as well as a large number of the cheaper runabout patterns; Chicago, for the most part, bought the vehicle that retailed for from \$700 to \$1,000. The fact is, the West has not yet made up its mind that \$2,500 vehicles are within the reach of their pocketbooks.

The severe weather spoiled any demonstrating of the machines



during the first four days of the week, and scarcely a car was seen in front of the Coliseum with the exception of one or two air-cooled motors, but later in the week when the weather showed 30 degrees above zero, there was quite a string of machines in front of the building. Apparently zero weather is not advisable for gasoline or steam machines, or maybe it shows that very few people care to ride in an automobile while the thermometer is 10 degrees below zero.

The Chicago show, taken altogether, was a well arranged one, but the buyers of vehicles were not nearly so numerous as they were in New York, and many of the exhibitors were declaring toward the last of the week that they had attended their last show in Chicago and were not very enthusiastic in favor of any kind of a show. Some of them declared to me that they would be out thousands of dollars through the weeks spent in getting ready for, attending and returning from the Chicago show, and their factories were practically at a standstill owing to the business heads of the mechanical and commercial departments being at the show. I have never been favorable to trade shows; I have a record as an anti-show man and possibly my vigorous denunciations of the old bicycle shows which a number of years ago were run in Chicago by as thrifty a lot of showmen as ever tackled the business, may still be remembered. The bicycle trade suffered severely at the hands of show monsters, and it is doubtful if any manufacturers except a very few were ever benefitted in the long run by giving up their money for show space and the heavy expense that a show entails. Shows are usually given just at the very time when the factory and sales department should be most energetically employed in getting out and disposing of goods, and it seems to me that with a judicious employment of printer's ink and a capable traveling force much more satisfactory business could be done, than by patronizing shows where the manufacturer who is responsible, and who has responsible goods, is brought into cut-throat competition with the new imitative, untried concerns, who get orders solely through being brought in competition with well-established firms who have had to spend a lot of time and money to arrive at the high position which they hold. I would like to get the private opinion of show exhibitors on this question and will promise not to publish any letters sent me unless publication is desired by the writers; I believe that the end of this show business, at at present conducted, is a great deal nearer than most people think.

Some of the people who rented space in the Coliseum annex, and those that imitated the Harlem pioneer and just "squatted" there, seem to have labored under the impression that the annex was a Mid-way to the Coliseum proper. I have read Dante's story of the entrance to the Inferno, but it was only when I entered that annex, between the blazing of brazing forges, the flashing of Splitdorf's spark coils, the churning of motors, the occasional explosion of the gases, and the stentorian tones of the man who was selling metal polish did I fully appreciate what a comfortable sort of place Mr. Dante's place was by comparison, and amid the deadly fumes of the place which were choking me, I asked myself this serious question: "Is this Hell or Chicago?"



Speaking of fumes, draughts and other impedimenta to good health, the using of gasolene and the operation of motors and cheap acetylene lamps, the Chicago show took the biscuit in the way of fumes. Nearly every other man at the show was more or less sick and many will carry colds away from there that they will remember for many a day. The place tried the health of the best and strongest and it was cruelty to keep a woman there any length of time.

An English judge has just come down hard upon a poor man who affixed the name plate of a well known bicycle to his own production in the bicycle line. When a man buys a poor pair of boots, he said, he did not endanger his life; but when he buys a poor bicycle he does. The name plate on the bicycle is a kind of life insurance, and the man that forges that name plate commits a serious crime, which may lead to mutilation and death. More than it ever can be with the bicycle is all this with an automobile, and it is to be hoped that there will be no tampering with any of the trade marks which betoken a well built safe vehicle as opposed to the built-to-sell contraption which is a menace not only to its owner, but to all who may have the misfortune to approach it.

The autoist who thinks he knows it all is happy for a time,
For him the lights are brilliant and the bells are all achime—
But when the sad awakening comes the game seems very rough,
And then he envies wiser men who never made the bluff.

The recent election of the National Association of Automobile Manufacturers has left some sore places in the minds of some of the candidates and their friends. The West boldly



charges that the East, aided by some western men, who are believers in the gospel of "graft," gave the western people what the late lamented Mr. McClusky would call a "throw down." It had been all arranged that this year's president should be a Cleveland man, but the tip went wrong and I am glad I did not gamble on it, for when a counting of noses took place it was found that a young man of brilliant ability, but who was not in line for such an important promotion took the prize in a walk. That this same young man will make good is beyond question, as he comes from the West and has the good sense to come East and grow up with the country. It is no secret that M. J. Budlong won the N. A. A. M. presidential stakes as "a rank outsider," as the racing people would say, but I have an idea that some of the other horses were pulled and their riders should be brought up before the Jockey Club for examination.

Cleveland got to fighting as to whether Winton or White should carry the Western banner to the front, and while their respective partisans were grooming them Budlong came along and won under a strong pull. It is no violation of confidence to say that the rider or advisor of the new president knows how many beans make five. It was George H. Day that was in line for the office and could have been elected easily without any wire-pulling had he not declined; that he had good reasons for this declination will be made apparent before the year is over. The ring that for the moment controls the National Association of Automobile Manufacturers will have its day, and might have done a great deal worse than they did do in their election of officers, if that statement is of any satisfaction to them. What I have written is the truth and the ring knows it, just as the rank and file of the manufacturers know it, so what is the use to dissemble when our days are but short on this planet and truth or falsity dies with us.

People are interested in the price of things. A man never sees a good thing with a price tag on it without mentally sizing up his pocketbook alongside of it. It is a bit of human nature. Don't be afraid of the "other fellows" finding out about your goods—

unless you are engaged in a swindling operation. If your price is a fair one, the more people that know about it, the better it will be for you; if your competitor has an interest in learning your prices, he will find out any way.

It is astonishing what an interest some former anti-automobile publications are now taking in the sport. There was a time when an automobile and an automobile publication devoted exclusively to automobiling was as a red rag to a bull, but now the publications that were formerly so hostile to everything connected with the automobile are all exceedingly busy getting out special automobile editions. Of course, a desire to capture some of the advertising does not enter into their present calculation, no more than did their attempt to strangle the industry at its birth did.



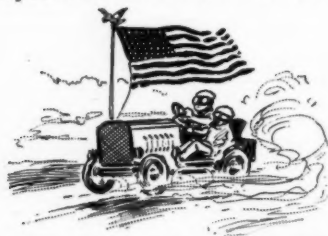
Not long since the carriage journals had editorials against the "new fad," as they termed it, and the carriage maker, with exception of such firms as Phineas Jones, the wheelmaker, would not give the automobile business any thought. They have now discovered that the automobile is a pretty good thing with which to keep their more or less idle factories in operation. Still there are not many of them tackling the business as a proposition of manufacture when it comes to the entire conveyance, since turning out anything as complicated as a motor vehicle is a little too deep for the carriage manufacturer, unless he be a Studebaker, of whom there is not an over-abundance in the trade. Automobile manufacturers, however, soon forget and they would just as leave give their former detractors an advertising order as they would a publication that trod the wine press alone in the early days which brought forth sore feet but little money from the treading.

With the return of spring the suburban seeking tourist is once more abroad, and since in the exuberance of the pastime the devotee of the automobile is prone to forget the rules and regulations made for his guidance, and the protection of the humble citizen afoot, it is well to caution all who move abroad amotor at this time to read anew the various rural, as well as city, ordinances bearing on this point.

Don't wait to be fined for scorching or for neglecting to equip your vehicle with a lighted lamp at night, to learn that there are ordinances bearing on these points. The law has considerable to say about these and similar matters. And remember generally that the pedestrian has some rights which are entitled to respect, even from an automobilist. It may also be pertinent to call attention to the misuse that may be made of the swift moving vehicle wherein the anatomies of both the automobile and its reckless driver may be made to suffer.

The motor vehicle, like fire, is a good servant, but a bad master. Few of the simple pleasures are so generally satisfying and beneficial as motoring, when it is not indulged in recklessly. And these are the things the automobilist should bear in mind at the opening of the outdoor season. Of course, many of them won't; but they will pay the penalty later on, as prescribed for all such.

There is more or less fog hanging over the composition of the proposed American team which is to gird on its racing armor, cross



the Atlantic and do valliant battle for the stars and stripes in trying to win the Gordon Bennett cup for this country. Apparently it has been thought necessary to introduce some politics and jockeying into the selection of the team, but, even so,

it is to be hoped that only the best men and vehicles in America will eventually be sent, since the best will be none too good for defeating that European aggregation, who are worthy of the best American steel, skill and courage. It will be a dangerous thing for any automobile club or association to play politics when it comes to selecting these best, and the possession of no great name, nor previous standing as a racing man should be allowed to interfere with our sending the best there is in the shop to fight on the enemy's own ground. I am afraid that at least one of the men who will be sent abroad has lost that supreme nerve, which, before all things, a winner must have. Personally, I would like to see this man's place taken by that dare-devil, Barney Oldfield, of Detroit, who is a driver who would make Mons. Fournier et Cie. turn the corners with only two wheels on the road.

In any event the good wishes of all Americans will go with our team, and Marconi thought-waves will follow them along the course, and, if necessary, will smite their opponents with confusion so they will travel the wrong course, since we deserve something to recompense us for being strangers in a strange land. Can't you imagine Percy Owen asking some frog-eating yokel how far it is to Versailles, and "Am I on the right road to——?" and the following moment having his ears assailed with a vocal gatling-gun speech in the equivalent of French with "Yes, yes; no, no," and the next Percy knows he will be sailing up some side lane probably on his way back to Paris thinking he is going right along with the procession. I would not trust a Frenchman for a guide anyhow, since if he ever dared to pilot the enemy he would very likely have to eat rats for the rest of his life.

The Chicago Automobile Club seems to have been more or less unfortunate with its presidents. After getting rid of its first president, Arthur J. Eddy, the club took on as his successor that well-known son of his mother, Honore Palmer. This last president has the misfortune to be a Chicago alderman and as such had the prejudice of his position



strong enough to cause him to back up some bill limiting the speed of automobiles in Chicago, whereupon he was promptly asked by the club to resign, which he did, like the obedient son that he is. What Chicago wants to pass such a fool law for is more than I can fathom, since the smoke clouds are too thick in Chicago to see a man coming or going (any way), especially when the wind is from the stock yards. Still, Chicago policemen seem to be gifted with some sort of a fatal second sight, as they timed Mr. Sackett, of the Locomobile Company, for two blocks and that timing two blocks cost Sackett just five dollars, which proves the Locomobile gasoline carriage can go some. Sackett said the speed was about 12 miles per hour, but the officers' Waterburys said the speed was just double that, and the judge agreed with the Waterburys and the watchers. This gives the lie to all statements that Chicago has no streets or roads because Sackett will swear on a Chinese bible that he was in no balloon when he traveled those two blocks and paid for them at \$2.50 each.

Florida is ablaze with automobile and good roads enthusiasm, and THE AUTOMOBILE MAGAZINE is receiving much credit from



Floridans who are talking automobiles and the automobile race meet which is scheduled to take place March 26, 27 and 28 on the famous Ormond-Daytona beach. The writer was sent by the MAGAZINE to Florida to spy out the land and to report if it was safe for our fast drivers to travel at a-mile-a-minute speed over the aforesaid beach. I

found it a land of sunshine and flowing with the Biblical milk and honey, not to say anything of oranges, alligators and negroes. The latter article is very plentiful, though he is not so prosperous as his Northern brother. The style of a Boston or a New York ducky would arouse lasting envy if seen by his poorer brother of Florida. Ducky and dogs go together, especially in Florida. If a ducky is poor he owns two dogs; if he is very poor he owns three dogs, and if he is extremely poor he owns a pack of them. The breed of the dog don't count; from personal observation, however, I can vouch for their invariable alertness in guarding their master's cabin.

AUTOMOBILE MAGAZINE readers who have not seen the beach at Ormond can expect to hear that all world's records are broken there for most distances straightaway for distances over one mile, as I believe it is the most remarkable natural speed course in the world. Centuries of ocean waves have succeeded in packing the sand until it is as hard as an asphalt street and as level as a billiard table. A course of twenty-five miles at low water is practical and the beach at extreme low tide is over one-quarter mile wide. The well-known Detroit manufacturer, R. E. Olds, invited the writer to take a trip with him in his Oldsmobile on the beach, and the way the clever little Detroit machine flew over those sands gave some indication of what a high-powered machine would do. Mr. J. F. Hathaway, of Summerville, Mass., who spends his winters at Daytona, has done much to popularize the above beach by sending photographs and particulars thereof to the leading daily and automobile papers. Mr. Hathaway can be said to be the original discoverer in an automobile way of the Ormond-Daytona beach, he having made

some records on it with a Locomobile two years ago. Daytona, where Mr. Olds was visiting, has organized an automobile club which is called the "Daytona Automobile Club" and which has a distinct Oldsmobile flavor, as most of the members have purchased the Detroit machine.

The idea of a Florida race meet was planned away back in last summer by the writer, and now it is proposed to make it an annual event. The primary purpose of the meet is to popularize Florida automobiling for the Northerner in the land of summer in winter. Dr. Hoover writes me from Jacksonville that the newspapers and citizens are not only booming the forthcoming meet, but are advocating the immediate construction of a main road running from Jacksonville to Miami, which is practically a road from one end to the other end of Florida. This road is to run near the east coast, but if built it will very likely result in another road on the west coast, so that eventually a road encircling the entire State may result. Florida needs the road, for the State is almost destitute of scientifically constructed well made roads at present. The trail or rural dirt road now being about all the State has, with the exception of some good highways around Jacksonville and some recently constructed roads at the west end of the State.

In starting the Florida race meet it was naturally expected that the transportation companies running from the east to the south, especially to Florida, should be interested, as it would mean revenue to them and a lasting advertisement for Florida. With the exception of the Seaboard Air Line and a sort of weak support by the Southern Railway the rest of the Florida carrying lines have not supported the idea other than to declare themselves perfectly willing to share in any increased traffic someone else's labors might bring them. The three steamship companies do not seem to care for automobile business, and this should not be forgotten. Two of them declared that they did not care for the freight part of the automobile business. Of course these companies will not refuse any business that may come their way, but the AUTOMOBILE MAGAZINE will be glad to recommend much more convenient routes to those who will journey to Florida for the meet with or without their machines.

Mr. J. P. Beckwith, General Passenger Agent of the Florida East Coast Railway, has given the whole affair splendid support, and will present a five hundred dollar cup in behalf of his road for

one of the races. Mr. Chas. B. Ryan, of the Seaboard Air Line R. R., Portsmouth, Va., will also donate a magnificent prize cup; the Daytona Automobile Club will offer two cups, as will the Florida Automobile Association. The Oldsmobile Company, of Detroit, will present two cups for the race open to drivers of their machines, and there are other prizes including a challenge cup which will be presented by Anderson & Price, managers of the famous hotel Ormond, at Ormond, Fla. Messrs. Anderson & Price have given the meet and the writer splendid support, and the party that will journey to Florida will be taken care of at the Hotel Ormond, which is the most delightful and best managed hotel in the State. The surroundings are exceptionally beautiful, including among other attractions two orange groves in full bearing.

Thanks to Mr. Chas. B. Ryan, his accomplished assistant, Mr. Stewart, of the Seaboard Air Line Railroad, of Portsmouth, Va.,



and the company's well-known representative, Captain McDonnell, of Jacksonville, I invaded and got out of the South successfully. A nice route to choose for making Florida

invasions is to do as I did; take a steamer from New York to Norfolk, Va., and the Seaboard Air Line from that point, or from Portsmouth across the river, to Jacksonville, from where, if you want to go to the East Coast where all of the famous hotels are, you can take the splendidly equipped Florida East Coast R. R. This road formerly charged five cents per mile, but recently it has reduced the fare to one equal to that demanded by almost all other railroads.

Returning from Florida I got lonesome and grieved because I had to go to Chicago, so when I was engaged in contention with the purser of the good ship Jefferson at Norfolk on the way back because he insisted on putting me in the bridal chamber—with a gentleman—I was delighted when the Scotch accent of a fellow-traveler fell on my ear with the query, "Where hae ye been?" and the next moment beheld by friend, Fred Calderwood, of Frederick Glassup's John Dewar & Sons New York staff. Calderwood had become a little tired of the variety of weather New York had been providing, so he had hied himself to the southland just as I had. Cal-

derwood tells a new story on an advertising man who went to Mr. Glassup for a share of Dewar advertising, which, by the by, is the most extensive of its kind in this country. The man had a nice line of conversation and in order to land the prospective ad he told Calderwood in confidence that he was born in Scotland. Calderwood is considerable of a wag and has a wit which Shakespeare would have pronounced "pretty." "I suppose then," said Calderwood, "that you are well acquainted with Sir Walter Scott's works?" To which the man replied: "Oh, yes, indeed, I have read them all." "You have read, I suppose, the 'Fair Maid of Perth,' the 'Waverley Papers,' 'Ivanhoe,' etc." "Yes, indeed," said he, "I know them all by heart." "Did you ever read 'Scott's Emulsion'?" asked Calderwood, who had some doubts of the man's Scotsmanship as well as of his reading. "Sure; I read that when I was a boy!" Which confession made Calderwood cough, as it set him thinking of the time when his mother dosed him with this liquid Scott product. Thus it came to pass that one advertising man's ignorance of the works of Sir Walter lost him an ad.

Judging from the appearance of things I saw in the South recently, it seems to me that it will be some time before the Southerner will discard his horse and mule and warm up to the automobile. The greatest cause for this is, of course, the utter absence of roads. There is no doubt, however, in my mind but what the South will eventually be an ideal and necessary winter pleasure ground for the northern automobilist. The manufacturer will also be able to make some hay while the sun shines in Dixieland, since it will be a good missionary field, even if it will need extensive cultivating to get a crop of business from.

The South has not yet recovered from the Civil War in a business way, even though the country there is getting northernized very rapidly. This statement reminds me that I rode on a trolley line recently in Raleigh, N. C., and I observed that the road from the depot to the main part of the town had been discarded, but the rails and wire were still there. I asked the conductor—a green-looking specimen of that ilk—but pleasant withal, whether northern capital controlled the line, to which he made the following frank statement:



"Yes, sir; I understand this line is now owned by northern people, and I hope it is, for it has lost a lot of money recently."

At the Chicago Show THE AUTOMOBILE MAGAZINE made an exhibit of Florida automobile pictures and photographs of the scenery around Ormond and Daytona, together with a display of automobile articles from the Florida papers, especially those from the leading Florida daily, the *Times-Union*, of Jacksonville.

Florida will please most people who visit it, the climate reminds you very much of that of the North, because it is so different. There is one thing about Florida, however, visitors will do well to remember, and that is time does not count. Pay no attention to the railroad time tables; a train will eventually arrive at its destination, if not on time, then later. If the hotel clerk at the ordinary Florida hotel is too busy admiring the scenery to answer your questions; don't worry him, he will answer in good time. This is peculiarly a trait of Jacksonville hotel clerks. If your waiter don't come with your meal at breakfast time you can safely predict his coming before dinner. If you are in a hurry for a carriage, just sit down and wait; don't hustle around, get cross and wilt your collar; don't place too much dependence on a negro when it comes to doing anything, he is a warmer proposition than the climate when it comes to slowing things down. Finally, go to Florida to rest, unless you are a racing automobilist and want to sample the delights of the famous Florida beach where your cheeks will be fanned by a mild ocean breeze while you store up enough ozone to last you long after you leave Florida.

Florida will undoubtedly become a great automobile touring ground in winter, and as the wealthy Northerners are going there in increasing numbers yearly, incidentally, it will be a very profitable investment for the manufacturer to have a salesman down there from January to March. I will be glad to furnish any and all particulars about the coming Florida automobile race meet to any who will apply to me in care of THE AUTOMOBILE MAGAZINE.

People rarely buy an automobile or anything else of an equal cost on the spur of the moment. They usually make up their minds to buy at some future time. Even after you have convinced your man, and he has made up his mind to buy the particular vehicle you have for sale, your ad ought to appear regularly, so as to remind him of his purpose.

THE SENATOR.

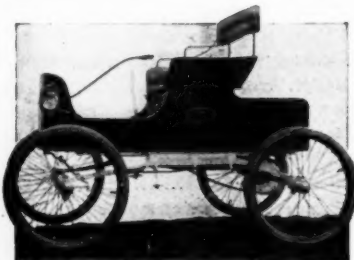
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The Most Powerful Moderate
Price Automobile Made

The "SANDUSKY"



A Neat, Light Runabout built for American roads. Mud, Sand and Hills shrink before it.

A model of simplicity, Quiet, Safe, Powerful and Economical. The carriage we build has been on the road for THREE years, and therefore is no experiment.

We are now prepared to put them on the market, and respectfully invite your correspondence.

A few good, live agents are wanted between New York and San Francisco. Applications must be prompt, as our 1903 output will be a limited but good one.

THE SANDUSKY AUTOMOBILE CO., Sandusky, O.

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Steel Castings, 25 pounds and under.

Estimates given on not less than 100 from each pattern.

THE AMERICAN BRAKE SHOE AND FOUNDRY CO.

170 Broadway

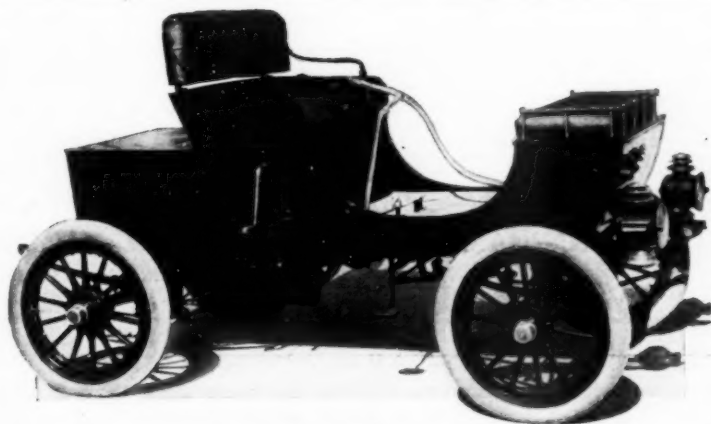
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== GASOLINE CAR ==

\$750



MOST for the MONEY
Ever Offered in an Automobile

Single Cylinder, Water Cooled Motor of 7-Brake Horse Power—GUARANTEED.

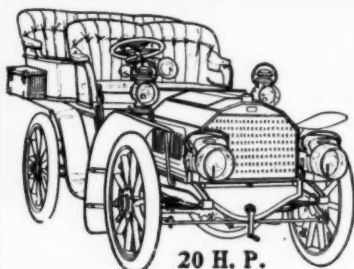
Built in our own factories, we do not buy parts and assemble the car, and we guarantee that

**It Won't Fall to
Pieces on the Road**

CATALOGUE, PRICES AND TERMS SENT UPON REQUEST

CENTURY MOTOR VEHICLE COMPANY
SYRACUSE, N. Y.

In answering advertisements please mention THE AUTOMOBILE MAGAZINE.



20 H. P.

Original 1903 Styles. Great Speed with perfect throttle control, quiet running, no vibration; every modern improvement is offered with the most

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Eight, 9, 12, 16, 20 and 24 horse-power models from 1 to 4 cylinders.

Darracq popularity is shown by the fact that THREE-FOURTHS of the entire business importation of automobiles in 1902 were DARRACQ CARS.

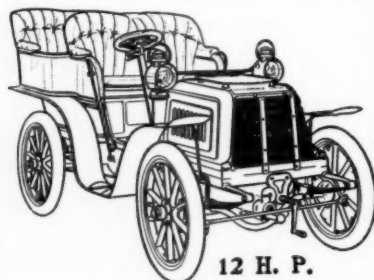
We have a few 1902—9 horse-power cars—bargains for quick buyers. See our *Delivery Wagons*.

Darracq Gasolene Motors sold separately.

Genuine Imported French Automobiles DARRACQ

CARS hold more records than any other make in the world. Weekly importations insure the

**Latest Styles and
Immediate Delivery**



12 H. P.

AMERICAN DARRACQ AUTOMOBILE COMPANY

Controlled by the F. A. LA ROCHE CO., Agents for the CLEVELAND ROADSTER
652 Hudson Street, near 14th Street Station 9th Ave. "L", NEW YORK

H A V E A L O O K



One will be enough to show you that the handsomest, smartest car being built to-day is

THE WINTON

The mechanical part of it is the best product of all WINTON experience. That means something if you think about it.

Twenty Horse Power WINTON Touring Car complete, \$2,500

THE WINTON MOTOR CARRIAGE CO.
CLEVELAND, U. S. A.

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THE VERDICT

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"Ask the Man Who Owns One"

Packard Motor Car

Price \$2500

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CHICAGO
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239 Columbus Avenue
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PACKARD MOTOR CAR CO., Warren, O.

JUST THE TIRE FOR OLDSMOBILES, LOCOMOBILES AND MOBILES.

SIZE, 28 x 2 1-2. 5 LUGS.



WEIGH 101-2 LBS. EACH. PRICE, \$10.50.
(Note the Weight.)

This is the best tire ever offered for the money. It is a heavy road tire, made of high-grade rubber and many thicknesses of fabric. Made to last and withstand hard usage.

Each tire has fabric rim protection strips to prevent chafing on rims, which ruins many tires.

Hundreds sold last year now in use giving satisfaction. If upon receipt they do not come up to your expectations, return them. We will refund your money.

THE POST & LESTER COMPANY,
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Cheap "Juice"

Why pay Electric Light Companies for charging the batteries of your vehicle or for lighting your house, when you can generate your own electricity?

FOR LESS THAN \$500

We will put you in a complete electric plant, and once installed it will virtually run itself. **Two cents is all it will cost you to write us for particulars.** Isn't it worth that?

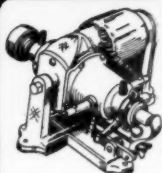
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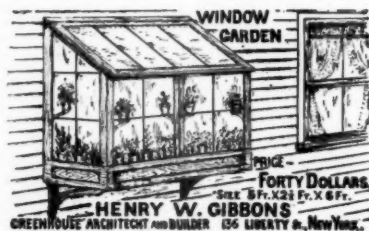
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